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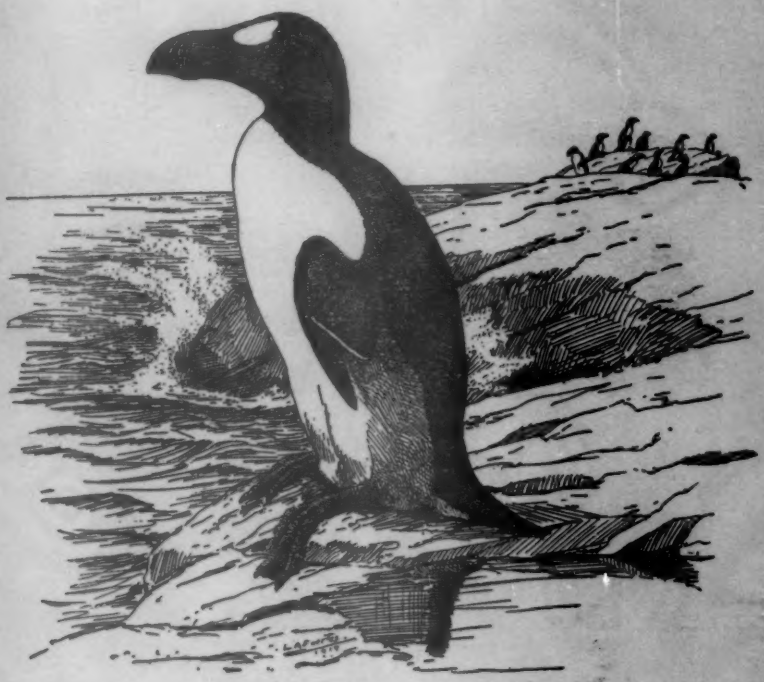

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YOUNG GOLDEN EAGLES SHOWING LORES INFESTED BY TICKS.

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INFESTATION OF RAPTORIALS BY *ORNITHODOROS AQUILAE*

BY RALPH B. WILLIAMS

Plates 7–8

WHILE collecting data for a life-history study of the Prairie Falcon, *Falco mexicanus* Schlegel, and while on banding excursions in northeastern Colorado and southeastern Wyoming, I observed that nestlings of these falcons and other raptorial birds were infested with larval ticks about the heads in the region of the eyes.

On July 17, 1942, I collected a number of the engorged larvae and forwarded them alive for identification to the United States Fish and Wildlife Service, Washington, D. C. This agency in turn forwarded the specimens to the Division of Insect Identification, United States Department of Agriculture, Washington, D. C., where they were classified as "very interesting larvae and nymphs" of some member of the Genus *Ornithodoros*. Attempts made there to feed the larvae and nymphs on domestic chickens failed, and all specimens succumbed after molting into the first nymphal stage. Searches were made in Weld County, Colorado, for additional specimens, but none could be found because all the young raptorial birds had left the eyries by the time the report was received.

R. A. Cooley, Senior Entomologist with the Rocky Mountain Laboratory of the United States Public Health Service at Hamilton, Montana, agreed to examine and classify the larvae and nymphs collected during the ensuing year. Modified Hixon jars and mailing containers were supplied by Doctor Cooley.

Beginning on May 31, 1943, I collected 12 immature *Ornithodoros* ticks taken as larvae from the heads, wings and bodies of five downy, week-old *Falco mexicanus* at Chalk Bluffs in Weld County, Colorado. It was noted that upon extremely young birds the larvae were at-

tached to various parts of the body, but later, as the feathers developed, they could be found only in the vicinity of the head, especially about the eyes. Ordinary thumb forceps were used to pull off the larvae, care being taken not to crush the engorged bodies. Removal of the larvae did not cause bleeding although some were very firmly attached.

The first group was given Rocky Mountain Laboratory accession number 20247 to be followed by No. 20262, *Falco mexicanus,* Chalk Bluffs, Weld County, Colorado, elev. 5780, June 16, 1943, 9 larvae; 20263, *Buteo regalis* (Gray), Chalk Bluffs, Weld County, Colorado, June 16, 1943, 17 larvae; 20264, *Falco mexicanus,* Chalk Bluffs, Weld County, Colorado, June 16, 1943, 6 larvae; 20267, *Aquila chrysaëtos canadensis* (Linnaeus), Simpson Creek, Weld County, Colorado, June 19, 1943, many larvae; 20269, *Falco mexicanus,* Pawnee Buttes, Weld County, Colorado, June 20, 1943, many larvae; 20270, *Aquila chrysaëtos canadensis,* Big Simpson Creek, Weld County, Colorado, June 20, 1943, many larvae; 20275, *Aquila chrysaëtos canadensis,* near Chugwater, Platte County, Wyoming, June 26, 1943, 13 larvae; 20278, *Aquila chrysaëtos canadensis,* Big Simpson Creek, Weld County, Colorado, July 4, 1943, 27 nymphs; 20279, *Aquila chrysaëtos canadensis,* Chalk Bluffs, Weld County, Colorado, July 3, 1943, 18 nymphs; 20280, *Falco sparverius sparverius* (Linnaeus), Big Simpson Creek, Weld County, Colorado, July 3, 1943, 1 nymph; 20281, *Falco mexicanus,* Chalk Bluffs, Weld County, Colorado, July 4, 1943, 11 nymphs.

Some of the above raptorial birds were so heavily infested that their eyes were almost closed; with this exception, however, the birds did not demonstrate any ill effects. I looked carefully for signs of "tick paralysis" but could find none. My observations do not agree with those of Webster (4) who states that only 35 per cent of the young *Falco mexicanus* survive the first month in northeastern Colorado. He attributed the mortality to a certain tick with which he was unfamiliar, but which he reported as obtaining a foothold and killing off a goodly number of the young falcons. Baerg (1) in his study of *Ixodes baergi* Cooley on *Petrochelidon albifrons albifrons* (Rafinesque) found that superficial examination of the nestlings' eyes did not show any serious injury as has been observed by Thomas (3) and Worth (5).

Three young *Falco sparverius sparverius* and seven young *Falco mexicanus* were taken into captivity during 1942 and 1943 and it was found that in each instance all falcons were free from ticks in any stage by the twelfth day. These falcons were taken from the

GOLDEN EAGLE EYRIE, CHALK BLUFFS, COLORADO. (*Right*) MAN'S HAND POINTS TO LOWER MARGIN OF ARIKAREE FORMATION WHICH CAPS WHITE RIVER FORMATION.

eyries just prior to their full-fledged stage. The larvae began to drop within seven days after removal from the eyrie. No precautions were taken to prevent re-infestation, but none occurred.

Extensive searches were made in the vicinity of the infested eyries for other stages in the life cycle of this tick. Debris and soil samples were taken from the eyries of the birds and from burrows of mammals. Large numbers of *Sylvilagus auduboni baileyi, Lepus californicus melanotis, Cynomys ludovicianus, Citellus tridecemlineatus tridecemlineatus, Citellus elegans, Citellus richardsonii, Dipodomys ordii,* and other species were shot and trapped, but ectoparasite collections did not reveal the presence of these ticks.

The ticks were found only on raptorial birds nesting in similar types of geological formations, while the same species of raptorials nesting on mud banks and in trees within short distances of these 'badlands' were not infested at any time during the seasons from 1942 through 1944. P. G. Worcester (6), Department of Geology, University of Colorado, Boulder, Colorado, informs me that "the Pawnee Buttes in Weld County are composed of the chalky white and gray Brule shales of the White River Formation which is Oligocene in age, capped by darker colored massive sandstone and conglomerates of the Arikaree formation which is Miocene in age. The protective capping of the Buttes is of course their outstanding feature." All eyries examined were found on ledges and in potholes in the Arikaree formation. The Chalk Bluffs are of very similar formation. Big Simpson Creek in Colorado flows for the first eight or nine miles south of the Wyoming line on the Arikaree; then it cuts into the underlying White River formation. The bluffs near Chugwater and Wheatland, Wyoming, are of similar geological materials and formations. Worcester states that "the White River formation underlies the whole area of southeastern Wyoming and northeastern Colorado, and it is covered in many places by the Arikaree and Ogallala formations. Erosion through the Arikaree and Ogallala would expose the chalky materials of the White River." There may be no significance in my observations, but these ticks have not been observed outside the given type of geological formations and each yielding formation is quite widely separated from the others by open prairies on which the nesting raptorial birds were free from infestation.

The larvae sent to Doctor Cooley were first fed on an immature *Buteo regalis* and later on mice and guinea pigs. His attempts to feed them on young domestic chickens were not successful. Some of the larvae were reared to adult stages and five females and four

males were obtained. From the larval, nymphal, and especially from adult characters the ticks were found to constitute a new species, *Ornithodoros aquilae* Cooley. This form is closely related to *O. talaje* (Guerin-Ménéville, 1849) and *O. kelleyi* Cooley and Kohls 1941, and can easily be confused with them.

The adult stages of this tick have not been found in nature. Other ectoparasites collected in this study were of little or no significance; they were not found so frequently nor so consistently on all species of raptorial birds as were the *Ornithodoros aquilae*. Of these the Mallophagon *Degeeriella fusca* (Nitz.) was the second most consistent form collected.

LITERATURE CITED

BAERG, W. J.
1944. Ticks and other parasites attacking Northern Cliff Swallows. Auk, 61: 413–414.
COOLEY, R. A.
1944. Ixodes ozarkus n. sp. and Ornithodoros aquilae n. sp. with notes on O. talaje and O. kelleyi (Ixodoidae). Jour. Parasitol., 30 (No. 5); 287–294.
THOMAS, RUTH HARRIS
1941. Ticks affecting birds' eyesight. Auk, 58: 590–591.
WEBSTER, HAROLD M.
1944. A survey of the Prairie Falcon in Colorado. Auk, 61: 609–616.
WORTH, C. BROOKE
1942. Ticks affecting birds' eyesight. Auk, 59: 576–577.
WORCESTER, P. G.
1945. (Personal communication.)

Juneau
Alaska

LONGEVITY OF THE AMERICAN HERRING GULL

BY HUBERT MARSHALL

THE longevity of birds has long been a subject of popular interest as well as a problem of biological importance. Prior to the last decade most longevity records were, of necessity, based on birds in captivity since returns from banding operations have only recently made possible an accurate estimate of the longevity of birds in their natural habitats. Gurney (1899), Mitchell (1911), and Flower (1926, 1938) have compiled records of the ages attained by birds in captivity and have attempted to evaluate the reliability of the many claims to extreme age set forth in the literature of the last several centuries. From their compilations it is apparent that individual passerine birds occasionally live for 20 years and that larger birds live on rare occasions to 50 or even 80 years of age. All three writ-

ers agree that the oldest bird, the record of which is beyond dispute, is a European Eagle-Owl (*Bubo bubo*) which lived in captivity not less than 68 years. Extreme as this age may seem, Flower (1938) is prepared to accept the record of a Griffon Vulture (*Gyps fulvus*) which lived for 117 years, although he notes that this record is not beyond question. These records give some estimate of the extremes of avian longevity, but the mass of the data make it clear that, even in captivity, individuals of most species have not been known to live greatly in excess of 10 to 20 years.

In the past 25 years many North American species have been banded in sufficient numbers to provide adequate data on the maximum as well as average ages reached by birds in the wild. The present paper presents a review of the literature on the maximum age reached by the Herring Gull (*Larus argentatus*), both in captivity and in the wild, and presents a study of the average natural longevity of the American Herring Gull (*Larus a. smithsonianus*).—The author is indebted to Chandler S. Robbins for many helpful suggestions and to Frederick C. Lincoln who has read the manuscript.

POTENTIAL LONGEVITY

Potential longevity is the maximum age reached by any individual of a species, irrespective of the environmental conditions under which it lived. Among birds the greatest recorded ages are almost invariably found among individuals kept in captivity where adequate food and protection from extremes of weather, as well as from predators, usually assure a far more optimum environment than is obtained by birds in the wild. Hence, it is no accident that the oldest Herring Gulls were reared as pets or in zoos.

Pearson (1935) has recorded the oldest Herring Gulls so far reported—a pair which lived for 49 and 45 years respectively and were survived by three descendants, all more than 30 years of age. The younger bird of the pair, the female, accomplished the further unexpected feat of laying eggs every season for 42 consecutive years (Gross, 1940). Other gulls have lived almost as long. Gurney (1899) reports one which lived not less than 44 years. Richie (1935) reports another which had been in captivity for 35 years in 1935 and which, according to Flower (1938), finally died at an age of at least 41 years. Many references to Herring Gulls less than 25 years old are found in the literature.

Flower (1938) has calculated that the 20 oldest Herring Gulls he could find had lived an average of 21 years, 11 months, and of the 20 birds, three were still alive at the time his calculations were made.

In an earlier paper, and using all reliable sources of information, Flower (1926) recorded individuals of 909 species which had lived six years or longer. Of these, 609 lived over ten years, 137 over twenty years, and 41 over thirty years. Since a number of Herring Gulls between 40 and 50 years of age have been reported, it is apparent that few species have a longer potential longevity.

POTENTIAL NATURAL LONGEVITY

Under the rigors of a natural environment, it is to be expected that potential longevity would be greatly reduced. Schüz (1936), in a summary of European banding records, reports the recovery of banded Herring Gulls of 21, 22, 23, and almost 25 and 26 years of age. Even more remarkable is the record of "Gull Dick," who for 24 years visited the neighborhood of Brenton's Reef lightship in Narragansett Bay where he was easily recognized by markings, voice, and disposition. He appeared annually and remained in the vicinity of the lightship from October 12 to April 7, during which time he regularly ate boiled pork and fish fed him by the crew. Although he never was banded, his presence was repeatedly confirmed and reported on many occasions by MacKay (1892, 1893, 1894, 1895, 1896, 1898).

The greatest recorded age for a banded Herring Gull on the North American continent is that of No. 207898, banded in July, 1922, by W. S. McCrea on Hat Island, Michigan, and found dead by D. McDonough on Beaver Island, Michigan, in June, 1939, after an elapsed time of almost 17 years. Since few Herring Gulls were banded in this country before 1921, it is to be expected that older birds will be recovered in the future. Whether North American Herring Gulls will eventually be found as old as those already recovered in Europe is a question depending upon differences, if any, between subspecies, and upon differences in environment. The evidence now at hand is insufficient to warrant speculation on this question.

AVERAGE NATURAL LONGEVITY

Average natural longevity may be defined as the mean age attained by a species in the wild. Few studies of average natural longevity have been attempted because it requires large numbers of recoveries of birds banded as young and subsequently recovered. The American Herring Gull admirably fulfills this requirement since thousands of young gulls banded at the nesting site have been recovered and reported to the Fish and Wildlife Service in Washington, D. C.

The assumptions on which such a study is based have been dis-

cussed by Farner (1945). Briefly, it must be assumed that individuals of a species which were banded as young and subsequently found dead constitute a normal sample of that element of the population dying each year. Since only a small percentage of the young birds are banded each year, and since only a few of these are recovered, the banding returns actually show only the average age of those birds banded and recovered dead by humans. There is no reason to suppose, however, that these birds do not represent an average sample of the birds dying every year; hence, the calculated longevity is undoubtedly close to that for the population as a whole.

Several important considerations, however, must be taken into account. While it is true that adult birds recovered dead represent a fair sample of the entire population, this does not apply to young birds found dead in the first several months after leaving the nest. The number of recoveries during this period depends largely upon whether or not the banders revisit the nesting island. If the banders return, many dead chicks are recovered, giving a disproportionate weight in the sample to those young birds which die before leaving the island. If the banders fail to return, few recoveries are reported during the first several months of the bird's life and the sample is disproportionately weighted with older birds. To avoid this difficulty, longevity expectancy is ordinarily calculated from an arbitrary date (September 1 in this study) when most or all fledglings have left the nesting area. After this date it is probable that dead individuals of all age groups have an equal chance of being recovered.

Secondly, since the number of birds banded varies from year to year, the mortality conditions prevailing in years of heavy banding will be unduly weighted in the population sample. This cannot be denied, but the data were collected over a 25-year period and hence it seems likely that years of severe or of moderate mortality are distributed evenly between years of heavy and light banding.

And lastly, a difficulty arises from the fact that birds dying of certain causes are more likely to be recovered than other birds, and that these causes may operate disproportionately on different age groups. Lack (1943c), for example, has shown that shooting is differential according to age for both the Black-headed Gull (*Larus r. ridibundus*) and the Lesser Black-backed Gull (*Larus fuscus graellsii*), since the young birds are more easily shot. So few banded Herring Gulls are shot in North America that no provision or correction was made for this factor. No doubt other causes of death are disproportionately represented in the present data, but whether these are differ-

ential according to age or form a sizable proportion of the data is difficult to determine. The cause of death is recorded for only a minority of the recoveries, but from an inspection of the banding returns it seems likely that no serious error arises from the data being heavily weighted with any particular cause of death.

The banding returns used in this study are from the files of the Division of Wildlife Research, United States Fish and Wildlife Service. Returns were used only from birds banded as young (June, July, and August) in the years prior to 1940 and subsequently recovered dead. September 1 was selected as the arbitrary date from which all longevity estimates were calculated. After this date there were almost no recoveries at the banding sites, indicating that young birds had left the vicinity and were as likely to be recovered as any other age-group in the population. Since the data on life expectancy subsequently presented apply not to a natural population, but only to that portion of the population surviving to the first September 1, it would be desirable if some estimate of the mortality between hatching and September 1 could be made. This would enable the calculation of the true average natural longevity. Certain technical difficulties, however, prevent its being attempted in the present paper.

The calculated estimates of life expectancy as well as the age-group composition of a stable population of Herring Gulls are shown in Table 1. A total of 3,806 recoveries were found which met the requirements of the study, a sample more than adequate in size. Columns 2 and 3 of Table 1 indicate the rate at which a population of young gulls is decimated under conditions of a natural environment. It is seen that of every 100 birds surviving to the first September 1, only 40 are alive a year later, 25 two years later, 17 three years later, and so on until in ten years the population has dwindled to almost nothing. That only 40 per cent of the birds alive on the first September 1 survive for another year is indicative of the rigors of the natural environment.

Viewed in another light, columns 2 and 3 of Table 1 show the age-group composition of a Herring-Gull population on September 1, provided the population is stable. Thus, for every 100 young there are 40 second-year birds, 25 third-year birds, and so on. Unless the population is assumed to be stable, the indicated age-group composition will vary with time. Since the data were collected over a 25-year period, they would represent the average composition of the population for that period if an equal number of birds had been banded each year. However, the heaviest banding of Herring Gulls

was done between 1936 and 1939, and hence the population considered in this paper is somewhat less representative of the period between 1921 and 1935.

Column 5 of Table 1 shows the proportion of the various age classes which die every year. It is seen that 60 per cent of the first-year birds and a much lower percentage of the older birds—36 per cent on the average—die each year. This trend is reflected in the calculation of life expectancy shown in column 6. Expectation of further life on the first September 1 is 1.5 years. Those birds which survive to their second September 1, however, have a further expectation of life of 2.3 years. The calculated expectancy for additional years ranges between 1.9 and 2.4 years. That mortality during the first year is far heavier than in succeeding years indicates, undoubtedly, the relative inexperience of first-year birds as compared with the ability of older birds to avoid danger and secure an adequate food supply. Farner (1945), in his study of the American Robin (*Turdus migratorius*), found no differences in life expectancy in the first and succeeding years. Lack (1943a, b, c, d.) likewise found no important differences for the European Blackbird (*Turdus m. merula*), Starling (*Sturnus vulgaris*), Song-Thrush (*Turdus e. ericetorum*), English Robin (*Erithacus rubecula melophilus*), and Lapwing (*Vanellus vanellus*). Several other species, however, showed important increases in life expectancy from the first to second year. The European Woodcock (*Scolopax rusticola*), for example, rose from 1.7 to 2.2 years; the Black-headed Gull (excluding birds reported shot), from 1.8 to 2.4 years; the Lesser Black-backed Gull (excluding birds reported shot), from 1.8 to 2.5 years; and the European Cormorant (*Phalacrocorax c. carbo*) from 1.6 to 3.0 years. All these, it will be noted, are birds of the marsh or open water.

Column 6 of Table 1 shows that 1.5 years is the expectation of further life for that portion of the Herring Gull population surviving to the first September 1. Hence, to determine the longevity expectancy of this portion of the population it is necessary to add to 1.5 years an estimated period equal to the time elapsed from the date of hatching to September 1. A brief perusal of the literature (Deusing, 1939) indicates that June 1 may not be too early as an average date for the hatching of Herring Gulls. This would add 0.25 year to the life expectancy as calculated from September 1, and would indicate a total longevity expectancy of 1.75 years for those Herring Gulls surviving to the first September 1.

CALCULATION OF LONGEVITY FROM MORTALITY RATE

The average natural longevity may be calculated by either of two methods: (a) by calculation from the mean age of birds recovered dead, as is done (in modified form) above, and (b) by calculation from the ratio of young birds to adults, which in a stable population indicates the annual mortality rate.

The mortality rate may be defined as the percentage of the population which dies annually. In a stable population, the birds which die each year are replaced annually by an equal number of young. Hence, the mortality rate is the average ratio of first-year birds to the total population, since the number of young alive on a given date is equal to the number of birds in the total population which will die during the forthcoming year. In the present study, column 2 of Table 1 provides the necessary data for calculating the mortality rate. The ratio of young to the total population is 3,806 to 8,081, or 47 per cent per year. Hence, on the average, 47 per cent of the Herring Gulls alive on September 1 die during the year and are annually replaced by an equal number of young which survive from the nesting season to September 1.

Burkitt (1926) provided a formula whereby the longevity expectancy might be calculated from the mortality rate when he showed that $Y = 1/M$, where Y represents longevity expectancy and M the mortality rate. Substituting in Burkitt's formula, it is found that the longevity expectancy of juvenile Herring Gulls living on September 1 is 2.1 years. Burkitt's formula, however, is predicated upon the assumption that mortality is spread evenly throughout the September 1–August 31 year; i.e., that the average date of death is six months from September 1. Calculation of the mortality data by months, however, shows that most deaths take place in the early part of the year since the population is greater at that time and because weather conditions are more severe. The data show that the average date of death is slightly less than four months from September 1, or somewhat more than two months sooner than assumed in Burkitt's formula. Applying this correction to the answer derived by formula, a corrected longevity expectancy of 1.9 years is determined. This is 0.15 year greater than the longevity expectancy of 1.75 years calculated from the mean age of birds recovered dead.

COMPARISON OF RESULTS OF DIFFERENT STUDIES

In the several studies dealing with life expectancy and average natural longevity of birds, different arbitrary dates have been select-

ed from which to calculate the age of birds recovered dead. Lack (1943a, b, c, d), for example, used August 1; the present study uses September 1, and Farner (1945) used November 1. The selection of different dates does not necessarily invalidate comparison of results between studies, but several implications arising from this situation have not been discussed elsewhere and can profitably be mentioned here.

As a general rule, the greater the period between hatching and the date from which life expectancy estimates are made, the greater will be the calculated longevity expectancy and with some species the same is true for the expectation of further life. This variation in longevity expectancy, with change in the date from which longevity estimates are calculated, is due to the fact that on different dates one is dealing with different populations; i.e., the population of a species on September 1 is different from what it was on August 1.

This difference in longevity expectancy and expectation of further life arising from different dates from which longevity estimates are made results from one or both of two reasons:

(a) The expectation of further life for some species such as the American Herring Gull, Black-headed Gull, and European Cormorant is greater at the beginning of the second and subsequent years of life than at the beginning of the first year of life. This is to say that as the bird progresses through the first year of life, its expectation of further life progressively increases. Hence, in studies of such species, the later the arbitrary date from which longevity estimates are calculated, the greater will be the calculated expectation of further life. Consequently, it is desirable to select as early a date as possible and thus include in the study as large a portion of the total population as possible.

(b) Longevity expectancy of juveniles alive on a given date is the sum of the expectation of further life on that date and the period elapsed between that date and the date of hatching. Since the expectation of further life does not ordinarily decrease with time, the longevity expectancy increases the later the date selected, due to the increase in the time elapsed between this date and the date of hatching. Hence, the later the date selected, the greater will be the calculated longevity expectancy.

It is seen that (a) applies only to those species in which the expectation of further life increases with time and affects both the expectation of further life and the longevity expectancy. On the other hand, (b) affects only the longevity expectancy and applies to all

species. It is suggested that these considerations may be of assistance in reconciling differences between studies of longevity expectancy of a species when different dates are selected from which estimates of life expectancy are made.

LONGEVITY OF NATURAL AND PROTECTED POPULATIONS

Lack (1943a) makes an interesting comparison between the life expectancy of protected populations (human or laboratory-animal) and avian populations. It is known, for example, that human life expectancy in the United States is approximately 65 years as compared with a potential longevity of slightly more than 100 years. Those Herring Gulls which survive to their first September 1 have a further life expectancy of 1.5 years as compared with a potential longevity of 49 years (and possibly much greater considering the inadequacy of present knowledge). Hence, Herring Gulls live about 3 per cent and human beings about 65 per cent of their potential life spans. The difference between average natural longevity and

TABLE I

SURVIVAL OF HERRING GULLS BANDED AS YOUNG AND SUBSEQUENTLY RECOVERED DEAD

1. *Year (starting Sept. 1)*	2. *No. alive at start of year*	3. *% alive at start of year*	4. *No. dying during year*	5. *% of those alive at start of year dying during year*	6. *Expectation of further life on Sept. 1 (years)*[1]
1st	3806	100	2298	60	1.5
2nd	1508	40	569	38	2.3
3rd	939	25	274	29	2.4
4th	665	17	191	29	2.3
5th	474	12	185	39	2.0
6th	289	8	138	48	1.9
7th	151	4	59	39	2.1
8th	92	2	26	28	2.2
9th	66	2	25		
10th	41	1	22		
11th	19		6		
12th	13		5		
13th	8		4		
14th	4		0		
15th	4		3		
16th	1		0		
17th	1		1		

[1] Calculated by averaging, for the birds alive on each September 1, the number of months between the selected September 1 and the date of death for each bird. It is assumed that all birds dying within a given month died on the 15th day of the month.

potential longevity is a rough measure of the severity of the natural conditions under which a species lives and gives some hint of the difference in the age-group composition of the two populations.

An additional comparison is of some interest. Column 6 of Table 1 shows that there is little or no decrease in the expectation of further life as the Herring Gull advances in age; i.e., a bird eight years old has as much expectation of further life as at any previous time after the first year. Hence, expectation of further life for the Herring Gull, after the first year, is not increased by additional experience or greater physical maturity and seems almost wholly independent of the decline in vigor attendant with old age and senescence. In a human population, on the other hand, expectation of further life decreases steadily with advancing age, after the first three years, because the conditions of modern life assure that relatively few individuals die before death takes its great toll in the years of old age and natural decline.

SUMMARY

A review of the literature on the life expectancy of the Herring Gull revealed that the oldest known gull lived in captivity and died at the age of 49 years. A number of gulls which lived more than 25 years are mentioned. The greatest known age for the European Herring Gull in the wild was found to be almost 26 years; on this continent the greatest recorded age is almost 17 years.

The assumptions on which a study of average natural longevity are based are discussed and data are presented which lead to the following conclusions:

(a) The longevity expectancy of that portion of the American Herring Gull population which survives to the first September 1 is 1.75 years.

(b) The expectation of further life on the first September 1 is 1.5 years and in succeeding years varies between 1.9 and 2.4 years.

(c) The age-group composition of the Herring Gull population is such that only 40 per cent of the birds survive one year, 25 per cent for two years, and only 1 per cent for ten years.

The longevity expectancy of juveniles alive on September 1 is calculated from the mortality rate and differs by only 0.15 year from that calculated from the mean age of birds recovered dead.

REFERENCES CITED

BURKITT, J. P.
1926. A study of the Robin by means of marked birds. Pt. 5. British Birds, 20: 91–101.

DEUSING, MURL
1939. The Herring Gulls of Hat Island, Wisconsin. Wilson Bull., 51: 170–175.

FARNER, DONALD S.
1945. Age groups and longevity in the American Robin. Wilson Bull., 57: 56–74.

FLOWER, STANLEY S.
1926. Contributions to our knowledge of the duration of life in vertebrate animals.—IV, Birds. Proc. Zool. Soc. London, 1925: 1365–1422.
1938. Further notes on the duration of life in animals.—IV, Birds. Proc. Zool. Soc. London, Series A, 108: 195–235.

GROSS, A. O.
1940. Migration of Kent Island Herring Gulls. Bird Banding, 11: 129–155.

GURNEY, J. H.
1899. On the comparative ages to which birds live. Ibis, 1899: 19–42.

LACK, DAVID
1943a. The age of the Blackbird. Brit. Birds, 36: 166–175.
1943b. The age of some more British birds. Brit. Birds, 36: 193–197.
1943c. The age of some more British birds. Brit. Birds, 36: 214–221.
1943d. The life of the Robin. (H. F. and G. Witherby, London.)

MACKAY, G. H.
1892. Habits of the American Herring Gull (*Larus argentatus smithsonianus*) in New England. Auk, 9: 221–228.
1893. Larus argentatus smithsonianus. Auk, 10: 76.
1894. Further notes on the "Gull Dick." Auk, 11: 73.
1895. "Gull Dick" again. Auk, 12: 76.
1896. "Gull Dick" again. Auk, 13: 78.
1898. "Gull Dick." Auk, 15: 49–50.

MITCHELL, P. CHALMERS
1911. On longevity and relative viability in mammals and birds; with a note on the theory of longevity. Proc. Zool. Soc. London, 1911: 425–548.

PEARSON, T. G.
1935. A Herring Gull of great age. Bird-Lore, 37: 412–413.

RICHIE, J.
1935. Great age of Herring Gull. Scottish Naturalist, May–June: 69–70.

SCHÜZ, E.
1936. Bericht (1935) der Vogelwarte Rossitten der Kaiser Wilhelm-Gesellschaft zur Förderung der Wissenschaften. Vogelzug, 7: 68–78. (Reviewed in Bird Banding, 7: 130, 1936).

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SOME OBSERVATIONS ON THE CAROLINA WREN IN LA SALLE PARISH, LOUISIANA

BY H. H. CHAPMAN

AN unusual opportunity was afforded the writer for studying the habits of the Carolina Wren, with especial reference to the care and feeding of the young. From 1920 to 1941 the Yale School of Forestry maintained a tent camp at Urania, Louisiana, from March 15 to June 15. The location was in a second growth mixed loblolly pine and hardwood forest, with an acre of open grassland, and the wren population was numerous, resulting in the nesting of three or four pairs of birds in and around the camp. From the first year on, the wrens were interested in the possibilities provided by the interiors of the tents, and built their nests on shelves, in boxes and even in a pair of pants hung from a hook, but never on the floor. Too often their efforts failed, sometimes through removal of the tents on leaving camp, or by reason of use of the receptacle chosen for the nest. Yet the practice continued for several years, and then gradually ceased altogether. There were just as many wrens about, but they abandoned the unreliable tents and reverted to their former nesting sites in the forest. Of this change of habit or adaptation there is no shadow of doubt. Whether inherited experience, or "acquired characteristics" was responsible, the fact is that after about two generations the wrens learned to avoid the tents, which their natural instincts had originally favored.

Before this transition took place, one pair of wrens had built its nest between a table top and a shelf six inches below the top, in a corner within a foot of the chair occupied by the writer. Thus every move by the parent birds, and the crop of young wrens, was under close observation whenever he was in the tent.

While no scientific record was kept as might have been done had the writer had no other occupation, the following data can be cited. Incubation proceeded normally, the bird remaining on the nest without flushing during his entry, presence or exit. On hatching, the diet first consisted of very small spiders, which selection increased in size with the growth of the infants. After a week to ten days, the old birds switched to grasshoppers, from which the legs had been removed. A little later, legs and all went down. In the final stages, large grasshoppers, with legs, constituted the main diet.

The mystery of nest sanitation constituted an almost unbelievable adaptation, but there was not a single deviation from the rule. The pellets excreted by the fledglings were coated with a substance which

made them, in effect, a capsule. But the miracle was this. In not one instance did a young bird evacuate unless one of the parents was perched on the rim of the nest. Then, instead of an indiscriminate action, the small bird, wherever it happened to be in the nest, under or on top, struggled violently until it had freed itself and presented its stern to the old bird. This occurred after the parent had promptly disposed of its mouthful of insectile food down the nearest gullet. As the evacuation took place, the parent bird clamped the pellet in its bill, without its touching the nest, and flew off, dropping it from 50 to 100 feet away. The nest remained sweet and clean until it was abandoned. Query—did the old birds "teach" the young ones the elements of nest sanitation, or was this an instinctive, hereditary behavior? My inclination is to believe the latter postulate.

One evening, as dusk was falling, the writer was giving the students a talk, and was interrupted by a tremendous din of chattering from the two parent wrens, which continued for about ten minutes. As darkness fell, the birds ceased their noise and, following the undeviating demands of nature, went to sleep. Shortly afterwards, when the writer entered the tent, a black snake was discovered raiding the nest. Of the five young wrens, it had killed two. The other three had jumped out of the nest and escaped, though the snake would probably have found them had it not been killed.

But the crowning demonstration was to follow. A day or two later the young birds left the nest and crouched on the floor in a corner, making no attempt to fly. On the following day, it happened that the tent was tightly closed against an afternoon storm and the old birds had no access. Shortly thereafter, with the evening sunshine, the parents were observed to be highly excited and chattering volubly. On entering the tent it was found that all three of the young wrens were flying about the tent. The flaps were thrown back and, one after another, these young birds took flight through the opening, and went a distance of 100 feet or more before coming to earth. Query—do the old birds "teach" the young ones to fly and if so can they impart this knowledge by voice alone, with no possibility of demonstration? I think not, and therefore choose to differ with an author in a recent issue of Harper's Magazine [1] who dogmatically states that parents have to teach young birds to fly. In this instance, by accident, the control of the experiment was perfect, excluding all possibility of "instruction" and leaving, as the sole cause of the sudden mastery of flight, the inherited instincts of the race.

[1] Bergan Evans, Professor of English, Northwestern University. From 'The Natural History of Nonsense,' Harper's Magazine: 543–551, June, 1946.

Undoubtedly there are innumerable ways in which the young of birds and mammals are instructed and educated in the art of survival, and the rôle which instruction plays in this process probably increases with the higher forms of life and the greater progressive development of intelligence, culminating in man. In the reverse direction, with more primitive forms, parental care is minimized, until it is non-existent, and inherited instinct alone can account for the protective actions of the offspring. Parental responsibility and the development of the brain and higher functions of intelligence appear to be closely related. It might be said in closing, that the greater the need for this responsibility and training, the greater the penalties for failure, as witnessed by the antisocial behavior of neglected children. Inherited instincts remain a powerful and compelling force in man, but without deliberate control and training, beginning in infancy, these instincts, instead of serving to protect against danger, to perpetuate the race, and to encourage strong individual efforts directed towards the attainment of well rounded character, become the dominant force which results in the destruction of the individual and immeasurable harm to all who are associated with him.

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LIFE HISTORY OF THE TURQUOISE-BROWED MOTMOT

BY ALEXANDER F. SKUTCH

Plate 9

DURING my early years in Central America, few birds so attracted and delighted me as the motmots. The first species in this beautiful family whose nest-life I studied was the Turquoise-browed Motmot (*Eumomota superciliosa*) of which I found two occupied burrows (of the race *euroaustris*) in the Lancetilla Valley near Tela, Honduras, in 1930, and two more (of the race *sylvestris*) near Los Amates in the Motagua Valley of Guatemala, in 1932. The following year, 1933, I was able to work out the life history of the Blue-throated Green Motmot (*Aspatha gularis*) in the high mountains of Guatemala, and in publishing I gave precedence to this more mature and thorough study (Auk, 62: 489–517, 1945). In the present paper I wish to make amends for the neglect of an earlier love, and to place on record what I was able to discover of the habits of a member of

the family that dwells in the lowlands, and is probably more typical than the green motmot of the high mountains.

The Turquoise-browed Motmot ranges through the lowlands from southern México to northwestern Costa Rica. On the whole, the species prefers more or less arid, open country such as prevails along the Pacific coast from the Gulf of Nicoya northward into México, but on the Caribbean side of Central America is met chiefly in mountain-rimmed valleys in northwestern Honduras and adjacent parts of Guatemala, and on the Yucatán Peninsula. I found Turquoise-browed Motmots exceedingly abundant in the arid portion of the Motagua Valley of Guatemala between Zacapa and Progreso. Here they live in a semi-desert, among cacti, prickly pears, and low, thorny, scattered trees, and along with the Chestnut-headed Motmots (*Momotus castaneiceps*) are among the most abundant and conspicuous of the feathered inhabitants of the region. The sandy walls of barrancas and the rises of the terraces on the barren hillsides are penetrated by innumerable nesting burrows, most of which appear to have been made by these two species of motmots. But farther down the Motagua Valley, where rainfall and humidity are high and the vegetation as lush and heavy as I have seen it anywhere in tropical America, Turquoise-browed Motmots are also abundant, although they appear to be somewhat less numerous than in the arid country. The same is true of the humid and naturally heavily forested Caribbean littoral of Honduras. In these regions of high rainfall our motmot dwells only in the cleared lands and the lighter and more recent second-growth, especially where the sandy banks of rivers furnish sites for its nesting burrows. I have never met the bird within the heavy rain forest. It seems likely that the Turquoise-browed Motmot has invaded the clearings in the rain forest from its headquarters in neighboring arid regions, but it has dwelt in the humid districts long enough for local races to have developed.

APPEARANCE

It is a paradox that one of the loveliest of birds is hatched and reared in a foul hole in a bank, and emerges at length with its wonderful feathers all undefiled. It is still more strange that the Turquoise-browed Motmot should find its colors in the earth, for they are not brightly glittering like gems and other earth products, but as soft and delicately blended as the rainbow and the sky at sunset. Central America has numerous birds more brightly colored — many orioles, tanagers, trogons, jacamars and hummingbirds are far more brilliant—but the subdued beauty of the motmot is of a distinct and

perhaps a higher order. While these others might be painted in enamels, only pastels could do justice to the plumage of the motmot. Its brightest color is the broad band of turquoise above each eye, margined below by a black line extending from the base of the strong black bill to the ear. Behind each eye is a triangular patch of chestnut. The body plumage is olive-green and chestnut, delicately blended; and the bird's throat bears in its center a conspicuous, short, black streak, bordered on either side with blue. The wing-coverts are olive-green and the remiges blue, broadly tipped with black. But the feature of the motmots which most attracts our attention is the tail. The two central feathers extend far beyond the lateral ones and their shafts are without vanes for a considerable length. At the end of each naked stalk is a roundish disk of vane, blue tipped with black. The Turquoise-browed Motmot is at once distinguished from the Chestnut-headed Motmot and the Blue-diademed Motmot (*Momotus momota*) with which it associates, by the much greater length of the denuded portion of the shaft, which imparts to its tail an airy grace that the others lack. Male and female are indistinguishable in plumage, and both alike trim their tail feathers.

The elegance of the motmots' plumage is fully matched by the grace of the birds' bearing and movements. They are of a rather sluggish disposition and sit long and motionless in one spot, often in a willow tree overhanging a stream, where with a pair of good binoculars one can admire at his leisure their varied plumage. They are by no means conspicuous against a background of foliage, and on dull days it is often difficult to distinguish them until at length they move. As they perch quietly as though sunk in meditation, they at intervals turn their heads from side to side, or swing their racquet-shaped tail feathers slowly from one side to the other, like a pendulum which has almost lost its impulse. The motmots' movements, following a long period of inactivity, come with a suddenness and rapidity which take the watcher by surprise and make them difficult to follow. It is amusing to witness the bird's quick 'about face' when perching on a twig. Its long tail is whisked up and over the perch with a graceful twitch such as a flag-bearer would use in handling his banner to prevent its furling on its pole. The motmots' flight is rapid and undulatory, but rarely continued for long distances.

FOOD

Because of its sedentary habits, the Guatemalans sometimes call the motmot *pájaro bobo* or 'stupid bird'; but too often a placid dis-

position is mistaken for dullness. As they perch in seeming abstraction, the motmots keep their eyes open for suitable food, upon which they dart with astonishing swiftness. They subsist upon insects of many kinds, including beetles, caterpillars and butterflies, and upon spiders, lizards and worms. They make a swift sally, without alighting pluck their prey from the foliage upon which it is crawling, and return in a trice to their original perch, against which they beat out its life before they swallow it. The loud, regular clacking of the heavy bill striking against the limb may often be heard when the motmot is out of sight in the thicket. Motmots have very keen eyesight and can discern a green larva against a background of green foliage at a surprising distance. At times they sally forth to catch an insect passing on the wing, in the manner of a flycatcher. Along with jacamars, they are among the few birds that pay much attention to the larger and more showy butterflies.

VOICE

In northern Central America, motmots in general are sometimes known by the name *toro voz* (bull-voice), which fits this species even better than the others. Although usually silent birds, in the mating season, which begins in March, Turquoise-browed Motmots frequently call *cawak cawak,* almost invariably twice in succession, or sometimes a single long-drawn *cawaaalk,* in a deep, throaty voice, as though they talked with a full mouth. In the scrubby thickets male and female call with their thick, lusterless voices, perch motionless side by side on the same branch, and at intervals fly down to examine the bare banks where they will soon dig their burrows.

EXCAVATION OF THE BURROW

Where there are sufficient sites for the burrows, each pair of Turquoise-browed Motmots prefers to nest in solitude; but where banks are rare in the midst of territory otherwise favorable to them, a number may dig their burrows close together. I recall a railroad cut in the midst of a large area of scrubby second-growth, poor in nest-sites, where seven pairs of motmots excavated their tunnels within a few yards of each other, despite oft-repeated interruptions by the passage of numerous pedestrians and an occasional train.

The Tela River, emerging from the deep shadows of the magnificent primeval forest which covers the precipitous mountain slopes among which it is born, flows for four or five miles through a flat and narrow valley to the Caribbean Sea. The bottom lands of the valley were once covered by banana plantations, but were abandoned

because of the ravages of disease and grew up with tangled, impenetrable, low thickets. Here lived many Turquoise-browed Motmots, which never ventured into the dark forests on the mountain slopes surrounding their valley home. As we rode on an open motorcar along the light tramline that led up the valley, we would sometimes, on rounding a curve, surprise a motmot perching on the telephone wire that paralleled the track. With a swift downward dart it would vanish into the dense thicket. At the end of April, 1930, I found a motmots' burrow in a low, sandy bank, beside a delightful reach of the stream, where the clear waters flowed over a clean, sandy bottom between willows and riverwood trees (*Pithecolobium* sp.). The owners of the burrow sat motionless in the willows for seemingly interminable periods. Once the one I took to be the male flew up beside his mate and solemnly gave her a morsel, all without a sound or any display; and on another occasion one of the pair drove off a Kiskadee (*Pitangus sulphuratus*) which had dropped down to forage on the river bank below the burrow.

The motmots no longer dug at the tunnel, which made it seem likely that egg-laying had begun; and since I was eager to follow all the details of the nesting, I promptly set about to uncover the nest-chamber. I dug into the soft, sandy loam with my hands, not daring to use a shovel for fear of breaking the eggs, and at length made an opening in the side of the treasure house, where four pure white eggs lay on the bare earth in the obscurity of the burrow. This was my very first motmots' burrow; and in my inexperience of nests of this kind I completely uncovered the chamber, then fitted it with a glass ceiling darkened and protected by a wooden lid, exactly as I arranged a burrow of the Amazon Kingfishers (*Chloroceryle amazona*) that I opened the following day. But the motmots' eggs were fresh, while the kingfishers had newly hatched young in their nest; hence the former promptly deserted, while the latter clung tenaciously to their offspring.

I was not altogether sorry that the motmots deserted their burrow, for three days after I had opened it they set about to dig a new one in the same bank, only a few feet away from the first. It is often more interesting to watch birds construct a replacement nest, which they are in a hurry to finish, than their first nest, which in the Tropics they may start long before it is needed and continue with exasperating slowness. One of the pair of motmots clung repeatedly to the bank at the point where the new tunnel was to begin; then they both set to work with such zeal that they drove their shaft hori-

zontally into the light soil for a distance of twenty inches in a little over a day. I constructed a blind of the leafy boughs of the river-wood tree, at a spot where I could command both their favorite perch—a dead branch of a willow tree—and the bank in which they dug. Here I spent many hours watching the pair at work.

Both male and female labored in the burrow, but it was soon apparent to me that they did not share equally in the task. There was no difference in plumage to betray the sex of either; but one occasionally brought an offering of a spider or an insect to the other, and since with most kinds of birds it is the male which feeds his mate, I called the food-giver the male. By a disarranged feather, or a dust spot on the plumage, I could distinguish the twain for short periods, despite changes in position. The supposed female did by far the greater part of the work, and was rewarded only rarely by her mate's offerings of food. Flying down to the entrance, she paused there a minute, then went in, throwing out a shower of sand, or to be more exact, two parallel, intermittent jets, as she kicked vigorously backward with her feet, alternately. This stream of sand shortened and eventually fell short of the entrance as the bird moved inward, but was probably continued until she reached the head of the excavation, with the result that each time she entered, some of the earth which had been loosened on previous visits was moved gradually toward the outside. She remained in the burrow for periods varying from one or two to eighteen minutes, and always backed out of the tunnel, tail first.

Upon emerging, the female motmot usually flew up to perch beside her mate in the willow tree. After lingering beside her a few minutes, he in turn flew to the tunnel. Sometimes he entered, throwing out earth as he went in, just as the female did, and came out tail foremost after from one to four minutes. It was impossible to see what he did while hidden in the bank, but I believe that we must give him credit for working. But on other occasions, after the supposed female had taken her place beside him, he dropped down to the entrance of the tunnel, alighted there, then returned almost at once to the willow-tree perch. Once he gave his mate a caterpillar, then flew to a point on the bank near the mouth of the burrow, where he clung a moment and then returned to his perch. As soon as he regained his post beside the female, she entered the tunnel and worked for five minutes. It certainly seemed that by his offerings and his visits to the tunnel he was trying to suggest that the female should return to her task.

At other times the motmot which I took to be the male paused in the entrance of the burrow, scratched a little with his feet, looked around at his mate, scratched out a little more earth, looked around again, and finally flew back to perch beside her, without having done any real work. Upon his return, the female usually went to the tunnel and continued with the excavation. Such behavior strengthened my impression that the male motmot was coaxing his mate to increase her exertions, and with a fair degree of success. On the second afternoon of my vigil, the female emerged after eighteen minutes in the tunnel and went to the willow tree to preen her feathers. Her mate now flew to the bank, to which he clung for a few minutes, then moved over to the entrance, where he alternately scratched and pecked with his bill at the sand, at intervals looking around at the female, who appeared to pay no attention to him. Rested at length from her former exertions, she flew to the burrow and the male made way for her, but instead of entering, she went at once to perch on a weed near by. Again the male returned to the entrance and repeated his former wiles, scratching and pecking as before. At last the female seemed to take heed of him, entered the burrow, and worked seven minutes more. While she toiled, the male sometimes stood in the mouth of the burrow, and sometimes pretended to dig with his bill at an adjacent portion of the river bank.

The first afternoon on which I watched, the pair worked until five o'clock, and drove their tunnel fifteen inches farther into the bank. The following day they again worked until five o'clock and added another fifteen inches to the length of their burrow. I did not watch them on the next day; but by the following morning they regularly emerged from the burrow head first, indicating that they had begun to widen the nest-chamber at the far end and could already turn around in it. The tunnel was now five feet two inches in length, and had been dug in somewhat less than five days. The diggers' plumage was still remarkably fresh, and appeared to have suffered little from their strenuous labors underground. Some people have a knack of keeping themselves neat and clean, no matter at what task they are engaged, and birds possess this innate tidiness to a high degree.

I decided, the following day, to make another excavation of my own, and with an assistant dug a vertical shaft from the surface of the ground behind the bank. This was situated so that it just touched the side of the enlargement at the end of the motmots' tunnel, into which we made an opening barely large enough to permit us to feel

inside with a hand. This aperture we carefully closed with a board, and felt confident that the birds would not resent so slight an interference with their work, while now it would be possible to learn when the eggs were laid. The nest-chamber had not yet reached its final dimensions, and in continuing their excavations the birds were evidently annoyed by the board, for they promptly abandoned their work. The *pájaro bobos* were not so obtuse as their name implies! Three days later I found that this pair had started a third burrow, midway between the two which they had deserted as a result of my interference, and lower in the bank. Before they finished this, I had successfully uncovered the eggs of another pair much nearer my residence, and I decided to allow these much persecuted motmots to complete their nesting without further molestation from me.

Sometimes the Turquoise-browed Motmots display considerable adaptability in digging their burrows; at other times they are quite lacking in foresight. Along the Río Morjá—a tributary of the Motagua—I found a burrow which had been excavated in a low bank beneath a cane brake. The bank was composed almost entirely of coarse gravel, into which the birds could not possibly have dug, overlaid by a shallow stratum of sandy soil only four inches deep where it was exposed. The motmots began their tunnel at the bottom of this sandy layer, of necessity nearer the top of the bank than any other burrow I ever found. Fortunately for them, the workable layer became deeper as they followed it inward from the bank; and they inclined their tunnel downward, with the result that the nest-chamber at its end was a foot below the surface, about the usual depth for burrows in low river banks. It is not probable that the birds could have foreseen the dip of the layer of sandy soil, yet they were sufficiently adaptable to take advantage of it when they discovered how it went, whereas most motmots extend their tunnels in a more nearly horizontal direction.

Another pair, less clever, began their excavation only ten inches below the top of the river bank, from the edge of which the ground sloped downward on the landward side. When they had nearly completed their tunneling they suddenly found themselves digging into the light and air—two surprised and disappointed motmots! They lost no time in beginning a second burrow near by; but it was now nearly the end of May and late for their nesting. Evidently the female motmot's need to lay her eggs became so pressing that there was not time to finish the work in the regular manner, for the pair widened the nest-chamber when the burrow was still only forty inches

long, and still so straight that with an electric torch I could see to its end.

The burrows of the Turquoise-browed Motmots closely resemble those of their neighbors, the Amazon Kingfishers, but are distinguishable by their slightly inferior diameter. Six that I measured were, respectively, 40, 51, 55, 55.5, 60 and 61.5 inches (102, 130, 140, 141, 152 and 156 centimeters) in length; but in Baja Verapaz, Guatemala, Owen (*in* Salvin and Godman, Biologia Centrali Americana, Aves, 2: 465) found burrows up to eight feet (244 centimeters) long. Most burrows curve gently to the right or the left, and it is impossible from the entrance to look into the nest-chamber at the far end. This enlargement at the end of the tunnel is 8 or 9 inches (20 to 23 centimeters) wide and about 4 inches (10 centimeters) from floor to ceiling at the center. Here the eggs are laid on the bare ground, and here the nestlings remain until able to fly. At the entrance the tunnel is about 3.5 inches (9 centimeters) in width by 3 to 4 inches (7.5 to 10 centimeters) in height. It is easy to distinguish occupied from deserted burrows. In the former the bottom is marked by two deep, parallel, longitudinal ruts or furrows, made by the feet of the motmots as they shuffle in and out. When the burrow is no longer in use the ruts become indistinct, and cobwebs are usually stretched across the tunnel. When the motmots have finished using their burrows, Rough-winged Swallows (*Stelgidopteryx ruficollis*) often build their nests in them. Now the bottom of the tunnel is marked by innumerable fine scratches instead of the two parallel furrows.

THE EGGS

My earliest date for the eggs of the Turquoise-browed Motmot is April 22, 1932. These eggs were in a burrow in the bank of the Río Morjá, a tributary of the Río Motagua, near Los Amates, Guatemala, and appeared to have been newly laid when the burrow was opened on this date. Another set of eggs, also apparently freshly laid, was uncovered in the same locality on May 1, 1932. Near Tela, Honduras, I found a set of eggs on May 5, 1930, and a second set, far advanced in incubation, on May 19. The earliest of these four sets consisted of three eggs, the other three sets of four eggs each. Owen states that in Baja Verapaz the set of the Turquoise-browed Motmot consists usually of four eggs. The eggs are pure white when newly laid, short-ovate, and resemble those of kingfishers. The fifteen eggs in the four sets mentioned above averaged 26.5 by 22.5 millimeters. Those showing the four extremes were 27.8 by 23.0, 24.6 by 22.2, and 26.2 by 21.8 millimeters.

INCUBATION

Male and female alternate in incubation, sitting an hour or more at a stretch. When one of the pair wishes to relieve its mate, it perches above the entrance of the burrow and calls in a low voice for the other to come out. In my experience, the motmots are more easily driven from their burrows than the kingfishers (*Chloroceryle amazona, C. americana* and *Ceryle torquata*) that inhabit the same region, and desert their eggs with less provocation. As they sit in the burrow they regurgitate the shards of beetles and the other indigestible portions of their food, until at length a considerable mass of this material accumulates on the floor of the nest-chamber and forms a bed beneath the eggs.

The curvature of the longer tunnels made it impossible to see the motmots as they sat upon their eggs, but the unusually short burrow already mentioned was sufficiently straight to permit a view of the lovely birds as they incubated. I went by night to visit this nest in the bank of the Río Morjá, passing through a silent grove of tall banana plants, whose polished stems glinted in the beam of my electric torch. Emerging at length on the river bank, I frightened up a Boat-billed Heron, which rose into the air and flew downstream uttering a weird *quok, quok, quok, quok, co-wa-ee.* On the sandbar on the farther shore, a raccoon feeding at the water's edge looked into the flashlight's beam with two brilliant orbs, then turned and walked deliberately away. Approaching cautiously along the sandy shore at the foot of the low bank, I threw the beam into the motmots' burrow, and beheld a creature which was strange to me. Some gray furry animal, bearing a large chestnut mark in the middle of its back, had stolen into the burrow, devoured the motmot and her eggs, and now slumbered curled up in her place. But no! There was turquoise on the animal's head and blue on its sides; it must surely be the motmot safe and sleeping peacefully on her eggs, but so transformed in the yellow light of the electric torch that I did not at once recognize her. Her back and all the regions which by day are a soft green appeared yellowish-gray, for they were compounded of colors inadequately represented in the rays from the incandescent filament. The bird's soft, loose plumage was fluffed out and looked very much like fur. But the blue on the wings, and especially the turquoise band on the brow, shone with such a bright and radiant luster (as though it were some hard and glittering porcelain, rather than the softness of feathers, which bore them) that I switched off the light, more than half expecting to find them self-luminous—but all remained dark in the burrow.

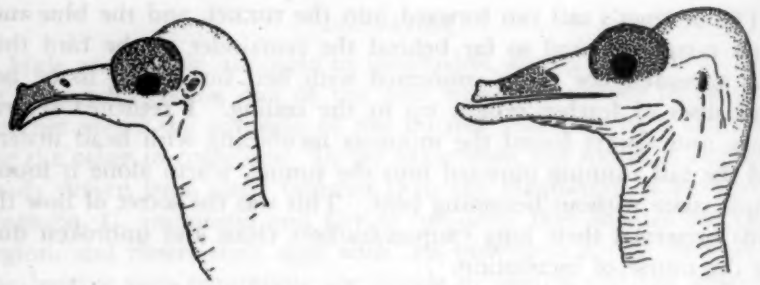
The motmot's tail ran forward into the tunnel, and the blue-and-black racquets rested so far behind the remainder of the bird that they appeared not to be connected with her, but rather to be isolated discs of feather caught up in the ceiling. I returned several times, and always found the motmots incubating with head inward and the tail running outward into the tunnel, where alone it found ample space without becoming bent. This was the secret of how the birds preserved their long racquet-feathers clean and unbroken during the course of incubation.

Of the length of the incubation period, I can only state that it is seventeen days or somewhat more. Once I opened a burrow which contained three eggs so fresh that the yolk shone through the thin, white shell, and no blood vessels were visible when they were held up to the light. After seventeen days they hatched. The incubation period of the Blue-throated Green Motmot is 21 days.

THE NESTLINGS

The first burrow of the Turquoise-browed Motmots which I succeeded in opening without causing desertion was situated in a low bank beside the narrow-gauge tramline which ran along the Lancetilla Valley in Honduras. As I dug down behind the nest-chamber, the owners perched in a tree across the tracks and uttered low, guttural notes of complaint, but otherwise showed no excitement nor made any demonstration. Making a small opening at the back of the nest-chamber, I found four partially incubated eggs lying among the beetle shards on the bottom. Then I closed with a board the aperture I had made, and filled in the pit with earth. Happily the motmots accepted my alterations and continued to incubate.

Eight days later, on May 27, I first noticed that the eggs were pipped. For more than twenty-four hours the little motmots tapped at their white prison walls, at times peeping weakly, before at last they broke through and effected their release. The parents now become bolder, and instead of deserting their burrow when I removed the board at the rear, merely retreated into the entrance tunnel where they voiced low, frightened grunts. The four pink-skinned, blind nestlings were without a trace of down or feathers, and bore considerable resemblance to the equally ugly new-born kingfishers. The most conspicuous difference between the two was in their bills. The upper mandible of the newly hatched motmot is somewhat longer than the lower and strongly hooked at the tip (Text-fig. 1), whereas the young kingfisher's upper mandible is straight and shorter than the lower. The nestlings peeped in a weak, hoarse voice, could



TEXT-FIGURE 1. Profile of Turquoise-browed Motmot (left) and Ringed Kingfisher (right); each one day old.

already stand and, sensitive to light although they were sightless, retreated into the tunnel when their nursery was opened at the rear.

To study the care of the nestlings, I constructed a little wigwam of coconut fronds on the side of the tramline opposite the burrow. Seated within this green retreat, I could watch the motmots without being seen by them. Both parents fed the nestlings, bringing food of the most varied sorts, including moths, large, brilliantly colored butterflies, small green mantises, green caterpillars, many insects too small to be identified as the birds held them in their bills, and small lizards up to six inches in length. The prey was, in most instances, dead by the time the parents arrived with it in the tree where they rested in front of their burrow, but if it still struggled, they knocked it vigorously against the perch until it became motionless before taking it to their offspring. Before a lizard was fed to the young, the reptile's head was apparently pecked or bitten off by the parents inside the burrow, and the viscera and soft parts pressed out through the neck. On several occasions I later found the empty skin lying almost entire on the floor of the nest-chamber. Rates of feeding varied greatly from day to day. When a week old, the four nestlings were given food ten times during 105 minutes. On the preceding morning they were fed only five times in two hours.

Although, while watching them, I was well hidden in my little wigwam of palm leaves, the parent motmots displayed the utmost caution in visiting the burrow. They never made a direct approach, but upon flying out of the thicket where they hunted, came first to perch in a small tree on the opposite side of the tramline, where they rested while surveying the surroundings with great deliberation. Advancing from this point, they sometimes delayed again on a banana leaf close above the entrance of the burrow; and many minutes were

lost between the first appearance of the parent with food and its final delivery to the nestlings. Often the two flew up together with food and perched in the low tree across the tramline. Here one lingered, sometimes uttering a low *wha wha,* while its mate entered the tunnel. When at length the latter came out tail first, as was almost invariably the way when they fed the nestlings, it flew up beside the waiting partner, which now in turn carried its offering to the hungry young. Sometimes one member of the pair, holding food in its bill, procrastinated in front of the burrow while the other came and went, feeding the nestlings several times in the interval. Thus one morning a motmot brought a lizard and delayed before delivering it to the young, holding the reptile for twenty-five minutes during which the mate fed the nestlings three times. Sometimes the parent delayed so long, holding food evidently brought for its progeny, that at last it grew hungry and swallowed the morsel itself, then flew away to hunt more.

At the age of a week the nestlings' eyes began to open, and the sheaths of the body feathers to push through the skin. When the burrow was opened at the rear, the youngsters retreated down the tunnel more quickly than at first, but could be driven back into the nest-chamber by throwing the beam of an electric torch into the entrance of the burrow. At the age of twelve days, the young motmots bristled with the long pin feathers, from the ends of which the true plumage was just beginning to burst. When they were twenty days old, we removed the youngsters from the burrow for another photograph, not without some difficulty in extracting one from its retreat in the tunnel, beyond reach from either end. The nestlings, now well feathered, screamed and attempted to bite when handled. The nest was becoming disgustingly foul and swarmed with maggots, for motmots devote as little attention to the sanitation of their burrow as the related kingfishers; and it was necessary to wash the bills and feet of the little birds to make them presentable for their portraits. Their docility, as they perched in a row on a stick, was in marked contrast to the restlessness of Amazon Kingfishers at the same age. Already they seemed to be acquiring a taste for a life devoted largely to motionless contemplation.

At the age of twenty-five days, when we removed the young motmots from their burrow for a final photograph, they resembled their parents in coloration and were very beautiful. We marvelled that such loveliness could have come into being amid such foul surroundings. Their contour feathers had long, pliant, free barbs, making

the plumage remarkably soft and downy. We noticed that both mandibles of the broad, heavy, black bill were finely serrated along the terminal third of their length, enabling the birds to hold their food the more securely; and that, like flycatchers, goatsuckers, and other birds which catch insects on the wing, they were provided with long, stiff bristles at the base of the bill. Their two outer toes were joined together for the greater part of their length, and only a single toe was turned backward, as with their relatives the kingfishers.

One of the twenty-five-day-old motmots, when removed from the burrow, slipped from our hands and flew into the dense thicket behind the nest, where it could not be recovered. The remaining three were posed for a photograph, but two escaped and covered about thirty feet with strong, direct flight. They came to rest on a perch at the edge of a thicket, slowly swayed their short tails from side to side in the manner of their elders, and made indescribable throaty noises which bore a recognizable resemblance to the calls of their parents. With difficulty we caught them and returned one to the burrow, which it left, apparently spontaneously, three days later, when twenty-eight or twenty-nine days old. Later, along the Río Morjá, I studied another burrow containing three nestlings. One of these slipped through my hands and flew too well to be retrieved when twenty-five days old; the other two departed from the nest when between twenty-five and twenty-seven days of age. Unfortunately, all of these young motmots had been handled; if quite undisturbed they would probably have lingered in the burrow a few days longer.

We kept two of the fledglings from the former nest in order to follow their subsequent development, and especially to watch the process of denuding the shafts of the central tail feathers. But when I beheld through the meshes of a cage a bird I had hitherto known only wild and free, I was overcome with remorse for what I had done. If I reared these birds as dull and spiritless captives, motmots could never be the same to me as they had been. I decided to return the twain to their parents, if it was not too late, and to take my chances as a field naturalist of seeing motmots trim their tail feathers in their natural environment. I carried the fledglings back to the vicinity of their burrow, where they heard the loud *cawak cawak* of their parents, and answered with weaker voices, higher in pitch. They flew from my opened hands into the thicket, whither their two nestmates had preceded them; and the parents led the united family farther into the impenetrable tangle. What I might have lost in knowledge I gained in inward satisfaction; for the motmots' nesting

had ended as I like every nesting over which I watch to end, with the parents leading their brood off to the feeding ground.

The years have sped by, and still I have failed to surprise a motmot trimming its tail feathers. In the dry limestone country of Yucatán, Turquoise-browed Motmots are said by Gaumer (Trans. Kansas Acad. Sci., 8: 63–66. 1881–1882) to nest and pass much of their time in caverns and crevices of the porous rocks and in the chambered walls of wells, in the seclusion of which alone they operate upon their tails. The districts in which I have known the species are devoid of such subterranean retreats, yet the motmots seem equally careful not to alter their tail feathers in public. I have never seen a Turquoise-browed Motmot with a fully grown central tail feather which did not have its shaft denuded. In early July, I found a young motmot, which was still attended by its parents, and whose central tail feathers projected only an inch beyond the others; yet the shafts were already naked for a short distance above the terminal racquets. On another occasion, at the beginning of the breeding season, I saw an adult motmot, evidently just through the molt, whose central tail feathers did not project at all beyond the lateral ones, yet the shafts were already denuded. The bare shafts were not evident against the solid background of the other feathers, and it was only when the wind blew the tail sideways, or by examining the bird through binoculars at close range, that I could distinguish them.

With other kinds of motmots, the central tail feathers are nearly or quite full grown before the vanes are removed from the subterminal portion of the shaft. This is true of the Lesser Broad-billed Motmot (*Electron platyrhynchum minor*). On Barro Colorado Island, in Gatún Lake in the Panamá Canal Zone, this motmot is abundant; and here in January, 1930, I encountered an individual with both of its central tail feathers of the same length and apparently full-grown, yet with the shafts everywhere bordered by the vanes. The vanes are originally narrower about an inch from the end than elsewhere, so that the feathers are somewhat racquet-shaped even before the birds begin to trim them. Several other Broad-billed Motmots which I saw at this time had the two central tail feathers of unequal lengths, and then the shaft of the longer, alone, had a denuded portion. Sometimes it was the right feather, sometimes the left, which was longer and had the naked shaft. One motmot appeared almost every evening, just about sunset, at the edge of the clearing in which the laboratory stood, and announced its arrival with a full, deep-toned *cwaa, cwaa.* One of its central tail feathers was apparently

full-grown, but the shaft had been cleared for a very short distance behind the terminal knob, while the other feather was about an inch shorter and still entire. The bird had two or three favorite perches to which he returned at each visit; and by focusing our cameras on these, Dr. Frank M. Chapman and I were able to obtain its portrait on a number of occasions. These showed that the naked portion of the shaft of the longer tail feather was gradually extended to the customary length, although the bird never worked at it in our presence. But when I left the island, more than three weeks after I first saw this motmot with a short length of naked shaft on one tail feather, it had not yet begun to trim the second, now nearly equal to the first in length.

SUMMARY

1. The nest-life of the Turquoise-browed Motmot (*Eumomota superciliosa*) was studied in northern Honduras in 1930 and in the humid lower Motagua Valley of Guatemala in 1932.

2. The motmots' food is almost entirely animal and includes beetles, caterpillars, butterflies, spiders, small lizards and worms. The prey is snatched from the vegetation at the end of a sudden swift dart, or else caught in the air.

3. Late in March the mated pairs begin to dig burrows in the vertical banks of rivers, sides of railroad cuts, and similar situations. Male and female share the task of excavation, but with one pair the bird supposed to be the female did most of the work. The mate fed her from time to time, and seemed to coax her to increase her efforts whenever she rested too long. A replacement burrow was dug in about five days.

4. Completed burrows go into the bank horizontally for about three to eight feet. Usually they curve slightly to one side or the other. At the inner end they widen into a low chamber where the eggs are laid upon the bare ground, for motmots' nests are never lined

5. The full set consists of four, or less often three, pure white eggs laid in April or May.

6. Incubation is performed by both parents and continues for seventeen days or more. The motmot sits on the eggs facing inward, its long tail extending outward along the entrance tunnel, where alone it can find room without being bent.

7. The newly hatched motmots are completely naked and have tightly closed eyes. At the age of twelve days the nestlings bristle with long pin feathers, from which the true feathers are just beginning to escape. When twenty days old they are well feathered, and

TURQUOISE-BROWED MOTMOT, TWENTY-SIX DAYS OLD.

closely resemble the adults in coloration. They remain in the burrow for twenty-eight days or more, not leaving until they can fly well.

8. Both parents feed the nestlings, bringing them a variety of insects and an occasional lizard. No effort is made to clean the nest, which soon becomes filthy and malodorous. Yet the young emerge with their beautiful plumage unsoiled.

9. The subterminal portion of the central tail feathers of both juvenile and adult birds is denuded of the vanes while these feathers are still no longer than the lateral ones.

10. Observations are given on the process of denudation of the shafts of the central tail feathers of the Lesser Broad-billed Motmot (*Electron platyrhynchum minor*). In this species, denudation does not begin until the feathers are nearly or quite full-grown.

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LOWERY ON TRANS-GULF MIGRATIONS

BY GEORGE G. WILLIAMS

A COUPLE of years ago I wrote a brief article (1945) saying that all available evidence pointed to the existence of major spring migration routes around the sides of the Gulf of Mexico, and that no good evidence for trans-Gulf migration in spring existed. Mr. George H. Lowery, Jr. (1946) has replied with a long article defending the traditional belief in trans-Gulf migration. His article is important enough to deserve the most careful analysis. The present paper, therefore, making no pretense to originality, devotes itself entirely to an examination of Lowery's contribution.

His article contains a wealth of new and valuable material which will be mentioned in due course. It contains also a wealth of errors. These belong to six principal types: lengthy straw-man arguments about admitted matter, misinterpretation of other observers' data, misinterpretation of original data, misinterpretation of my first article, cardinal omissions, and a tendency to formulate large general laws on the basis of a minute amount of fact. This last type of error pervades the whole article; the other five will be considered here in the order named.

1. ARGUMENT ON ADMITTED MATTER

1. Lowery continually implies that anyone's doubts about trans-Gulf migrations must rise from doubts as to the migrants' ability to

fly across the Gulf of Mexico. Yet I am unable to recall anyone who has ever maintained that a trans-Gulf flight is impossible. Reasons why birds go around the Gulf instead of across it are geological, evolutionary, and distributional; they have little relation to the birds' powers of flight.

2. Whether or not birds migrate across the Gulf in autumn has nothing to do with the problem of spring migration. It so happens that I have long known that some birds (especially young ones) cross the Gulf in autumn. But this has no bearing on the immediate problem of spring migration.

3. The so-called "coastal hiatus" which Lowery enlarges upon in the paper under discussion, as well as elsewhere (1945), has been universally recognized for years. But it proves nothing about trans-Gulf migration. Like the Ptolemaic system of astronomy, Lowery's explanation of the hiatus is one method of accounting for observed phenomena; but it is not necessarily the best method.

4. Lowery would impute to me the belief that *no* birds ever cross the Gulf of Mexico in spring. I never had such a belief; and my article stated the opposite very clearly: "It would be foolish for any man to say that no birds ever fly northward across the Gulf of Mexico in spring, or to deny that some individual birds may fly across the Gulf every spring." When millions of birds are migrating all around the central Gulf area during two months' time, it would be a miracle if no birds at all ever appeared out over the Gulf.

Lowery's extensive discussion of all this admitted matter gives a false impression of the problem. Future writers should stick to the point at issue.

II. Interpretation of Other People's Data

Like myself in my first article, Lowery leans heavily on two old published reports of trans-Gulf migrants—the papers of Frazar (1882) and of Helmuth (1920). He relies also on a series of notes made on a trans-Gulf voyage by his friend, Lieutenant Joseph C. Howell. I shall consider these three in turn.

1. The core of my analysis of Frazar's paper was that the birds he saw during a hard norther 30 miles south of the mouths of the Mississippi contained not only migrants, but also birds that do not occur south of the Gulf, birds known to migrate by land, and common winter residents of Louisiana. It was argued, therefore, that the birds he saw must have been blown southward from Louisiana; they were not migrating across the Gulf. Lowery answers this argument as follows:

By the same line of reasoning, one might argue that the birds could not have come from Florida since the flight contained large numbers of birds extremely rare in that state, and, moreover, they could not have come from Texas since the flight contained large numbers extremely rare there. However, the fallacy of such an argument is obvious. The birds must have come from somewhere. The fact that some birds in a flight originated from one source does not show that other birds in the flight could not have come from other sources. The idea that the bulk of Frazar's birds were trans-Gulf migrants involves at most the assumption that strays from the mainland may mingle in a trans-Gulf flight. Williams's theory, on the other hand, seems to require that birds were carried out to sea from three directions by a wind blowing from only one.

What a distorted picture of my argument is this! My analysis of Frazar's observations was quite simple: Birds were migrating along the Louisiana coast, some from the west, perhaps, and some from the east; other birds wintering in Louisiana were a-wing in the coastal region; a hard wind from the north came down suddenly and blew many birds, both migrants and winter residents, out to sea. One wind blew all the birds in one direction.

2. The argument was much the same with Helmuth's paper, except that I doubted (and still doubt) whether Helmuth was 125 miles from land, as he said he was, when he saw birds at sea in the midst of another norther with "terrific wind and rain." As a matter of fact, however, Howell's subsequent observations of migrants much farther from shore makes the argument here relatively pointless.

Helmuth saw, among other birds, a Henslow's Sparrow, Robins, and Louisiana Herons. Since the first two species do not winter south of Louisiana, I thought they must have been blown southward from the Louisiana coast.

But Lowery dismisses the Henslow's Sparrow as a case of mistaken identification—despite Helmuth's statement that the bird "stayed with us all day, very tame, and ate crumbled hard-tack and drank water from the boat-covers." Under these circumstances, throwing out this piece of evidence seems hardly justifiable. It is not like Lowery, who is a brilliant and careful scientist, and whose mistakes in the paper under discussion can be attributed only to an eagerness to defend a preconceived and long-cherished faith.

His treatment of Helmuth's Robins is almost equally unscientific. In the last 80 years, four birds identified as Eastern Robins have been reported from south of the Gulf. On the strength of these reports, Lowery says that the Robins Helmuth saw must have been migrating from south of the Gulf. Here is an example of a broad generalization made on the basis of a very small amount of concrete evidence. Virtually all biological principles are based on major proba-

bilities, not rare exceptions, and, so far as we know today, Eastern Robins directly south of the Gulf of Mexico are rare exceptions to the general rule.

Anyhow, Helmuth's Robins came aboard ship in the evening, after the "terrific wind and rain" that rolled the ship over to a 42 degree angle had been blowing all day. Is it reasonable to suppose that the Robins would have been able to push their way northward all day in the face of this storm? The same question is applicable to the Henslow's Sparrow and to the Louisiana Herons, which came aboard the ship the next day, *after the stormy weather had prevailed for at least 24 hours.*

Of the Louisiana Herons, I said originally: "The species is not known to migrate from regions south of us to Louisiana." Lowery, however, points out, very properly, records of two Louisiana Herons banded as nestlings in Galveston and recovered in autumn in southern México. Galveston is not Louisiana, and autumn is not spring. Nevertheless, Lowery makes a point there.

Otherwise, however, the relation of Helmuth's and of Frazar's papers to the problem of trans-Gulf migration remains exactly what it was when my paper appeared. They prove only that a hard offshore wind can drive birds far out to sea.

3. According to notes quoted in Lowery's article, Lieutenant Joseph C. Howell crossed the Gulf of Mexico from Galveston to the Yucatán Channel on May 3–6, 1945. On May 4–5 he counted 21 species of birds and at least 65 individuals aboard his ship when it was 121 to 361 miles south of the northern Gulf Coast. All but one of the birds seen on those days came aboard the ship; all were in a state of extreme exhaustion; and most of them stayed on board for at least 12 hours, some for more than 24 hours.

Lowery thinks that the birds had been migrating northward across the Gulf, and that "a moderate northerly wind blowing in the central Gulf area on May 3–5" was sufficient to halt their progress, and drive them exhausted to Howell's ship. As a matter of fact, however, the wind in the central Gulf area did not freshen past 12 m. p. h. till between 12:30 A. M. and 6:30 A. M. on May 4, and never passed beyond the 13–18 m. p. h. stage at any time. Furthermore, the skies remained clear.

Howell does not say exactly when the first birds came aboard, but he does say that most of them "came aboard during the daylight hours of May 4. No time of day was favored over any other." But since birds in mid-Gulf could not have met the fresh head-winds

until the early hours of May 4, they could not have been struggling against the wind (when they came aboard the ship exhausted) any longer than if they had been making an uneventful flight to the Louisiana or Texas coast. To call it a "struggle," indeed, is not quite accurate; the birds merely move forward at a certain air-speed, and are borne backward or forward or sidewise, as the case may be, by the air-mass in which they are suspended. What matters is the *time factor,* in so far as exhaustion is concerned. Why, then, should these birds, which (according to the trans-Gulf theory) had been on the wing no longer than would have been required for an ordinary Gulf crossing, be exhausted almost to the point of death? Lowery's explanation of their presence on the ship, and of their exhaustion, seems far-fetched. He is trying to defend an old theory, not to explain new facts.

But is there any reasonable explanation of the birds on Howell's ship, and of their exhausted condition? Yes, there is—though Lowery deliberately refrains from discussing it. The crucial period is May 3–5, 1945. Consultation of the weather data for the period reveals the following:

May 2: A cold front that extends in a southwest-northeast direction lies across central Texas, and is moving from the northwest toward the Texas coast.

May 3: General rains occur all along the Texas coast; the forward edge of the cold front moves out into the Gulf on a line roughly parallel with the Texas coast; a drop in temperature occurs all along the coast.

May 4: The temperature drops still further; steady northwest winds are blowing from the coast.

May 5: Winds on the coast shift to the east and southeast; the temperature begins to rise.

This was a major cold wave. Mr. E. A. Farrell, Meteorologist in Charge, U. S. Weather Bureau, Houston, Texas, writes to me: "The temperature along the Gulf Coast averaged 15°–20° below normal during the cold spell of May 4–5, 1945." Only two or three times previously in more than 20 years had the temperature in spring after April 25 fallen so low at key points along the Texas coast.

Knowing these extraordinary weather conditions, we can understand Howell's extraordinary visitation of birds. Presumably the birds were migrating along the western coast of the Gulf on the night of May 2–3. The cold front descending from the northwest struck them on their port beam sometime that night or early in the day-

light hours of May 3. To avoid the rains and the intense and unusual cold pressing from the interior of the country, the birds veered to starboard, out over the Gulf. As the cold kept increasing in intensity; as the cold air-mass kept coming down from the northwest like a great moving wall, pushing the birds before it; as the offshore winds began to catch the birds; and as the birds became more and more exhausted as they remained longer and longer on the wing, some of the birds eventually found themselves flying along more or less parallel with the cold front without venturing, or without having the strength, to resist its cold temperature or its steady offshore winds. This course ended in the birds being well out over the Gulf, where Howell saw them. Moreover, since they had probably been on the wing since the night of May 2–3, they were utterly exhausted when they came aboard Howell's ship in the daylight hours of May 4.

This interpretation seems much more consistent with fact and with reason than does Lowery's interpretation.

It may be worth noting, too, that every species that Howell saw was one that was said, in my first article, to be a migrant along the Texas coast. Moreover, the Red-backed Sandpiper (of which Howell saw one individual) does not normally winter south of the southern tip of Texas and the northern extreme of México. Unless it was one of those rare exceptions upon which Lowery tends to build broad hypotheses, it was not migrating northward across the Gulf.

III. Interpretation of Original Data

On a trip which he took southward across the Gulf of Mexico from New Orleans to Yucatán on April 30–May 2, 1945, Lowery saw about 56 land birds. Of these, all but 11 were Barn Swallows. These latter will be discussed presently; but just now I wish to examine more carefully the other 11 birds.

1. It may be recalled that my original thesis was this: The spring migrations occur along the coasts of the Gulf, sometimes right over the shoreline, sometimes well back from it or well out over the water, sometimes cutting chords across indentations in the coast, but, in general, following the actual broad outlines of the coast, and more or less within sight of it.

Now, of the 11 land birds (not counting Barn Swallows) that Lowery saw on his two-day trip southward, he saw four within three miles of land, and one within eight to nine miles of land, and all five within the space of about an hour near sunrise one morning That leaves only six land birds (still not counting Barn Swallows) for his remaining two days at sea. Even of these six, however, one

is an intermediate case: it was observed at 6:45 in the morning, only 21 miles from land, and was making toward the land, which it could undoubtedly see from a couple of hundred feet in the air. We have as much right to believe that the bird had been migrating along the coast in the early dawn, and had wandered slightly off-course as to believe that it was a trans-Gulf migrant.

In contrast to this concentration of birds near the shore, the other five birds were scattered out over 500 miles of sea. Of these five birds, three came aboard the ship; and of these three birds, two stayed on the ship long enough to be carried 189 miles in the wrong direction, and the other, "very tame," apparently remained on the ship for some time. That leaves only two birds, a Least Sandpiper and a Mourning Dove, which did not act like casual strays. But even these two birds circled the ship several times (as if they were lost?) before continuing away from it.

2. The Barn Swallows Lowery saw on his trip southward deserve special comment. My own article pointed out that Barn Swallows in considerable numbers had been observed migrating northward 20–30 miles off the Texas coast, parallel with the lower coast. But (I admit frankly) I did not think that even this flight, as its edges expanded eastward late in the season, would produce 45 swallows in two days. This is certainly an important count in Lowery's favor.

On the other hand, these 45 were an infinitesimal fraction of the Barn Swallows that would have been seen at the same time of year at almost any spot along the Texas coast. For example, I am just in receipt of a note from Lieutenant Commander Fred M. Packard in which he informs me that about 50,000 Barn Swallows passed over the Naval Air Station at Corpus Christi on the evening of April 30, 1946—a year to the day after Lowery saw his 45 Barn Swallows in two days. On May 5, 1946, I stood on the beach at Rockport for eight minutes and counted the Barn Swallows flying past parallel with the beach; I counted 118 in the eight minutes, or about two and one-half times the number Lowery saw in two days. Moreover, my count included only those in sight from the beach, not those which were migrating at the same rate all day long not only on the beach but also several miles back of it. Finally, it should be mentioned that Rockport is separated by a wide bay and an island from the Gulf beach itself, where the really major migrations occur.

3. On his trip from Yucatán back to Louisiana on May 10–11, 1945, Lowery saw no Barn Swallows (though the species is regularly observed on the Texas coast until late May or early June). But he

saw 11 other land-birds at distances from Louisiana of 342 to 16 miles. Three of these birds—Cape May Warbler, Bobolink, and Gray Kingbird—are known to have their regular migration routes through Florida almost exclusively. Indeed, up until the time Oberholser's book on 'The Bird Life of Louisiana' (1938) appeared, there were only three records of Cape May Warblers from the entire state of Louisiana, there was no record of a Gray Kingbird, and Bobolinks were extremely rare along the coast except in the east. The Gray Kingbird (seen by Lowery 32 miles from the coast of Louisiana) is an almost incredible anomaly. Without Lowery's notation: "I have no doubt whatever regarding the correctness of this identification," one would certainly doubt the record.

The very presence of a Floridian species like the Gray Kingbird hundreds of miles west and north of its usual range, and of the Cape May Warbler (which winters in the West Indies) out in the middle of the Gulf far to the west of its normal migration route, should have suggested to Lowery that something abnormal was occurring; and he should have looked for an explanation that would fit the case.

The explanation is there. Upon reading in Lowery's paper about the Cape May Warbler and the Gray Kingbird, I wrote to the U. S. Weather Bureau at Key West to ask whether any unusual weather phenomena of the May 8–11 period in 1945 might account for the birds on the Gulf; the usual weather charts had revealed no credible explanation. Mr. S. M. Goldsmith, Junior Meteorologist in Charge, became interested in the problem, and went to considerable trouble to give me data on the period. In his letter he wrote: "Apparently there was no unusual weather phenomenon in this immediate vicinity." But he added the following:

> Evidently the Everglades region (a vast muckland covering most of the southern peninsula of Florida) had some fires burning. The winter months are the dry season in south Florida. The water table in the Everglades region fed by Lake Okechobee, a large fresh-water lake in the interior of the southern section of the State, reaches the minimum during April & May. Campers, hunters, automobilists and fishermen are prone to leave campfires burning with resultant fires throughout the sawgrass section. Even farmers in burning off dead vegetation allow the fires to become uncontrolled. Lightning sets some fires but thunderstorms attended by severe lightning are rather rare in April. But once fires begin, the muck, which is a species of peat, burns slowly and to a great depth. Of course, smoke pours from the earth and at times reduces visibility to nil and blots the sun or moon from the sky. From a perusal of the record it seems certain that such fires attended the Everglades region during the period mentioned, and is it not possible that birds flying northward would become confused in such a smoke pall and veer off course? Then is it not possible that flying at various altitudes above the earth, the terrain would be blotted from their sight by such smoke and again be a cause of maldirection of movement?

Mr. Goldsmith appends the following table:

May 7, 1945: Smoke from Everglades fire restricting visibility at Key West to 2 miles in the morning and 4 miles in the p. m.
Light smoke which began day before 2000
Visibility as follows: 7 a. m. 2 miles; 1 p. m. 4 miles; 7 p. m. 6 miles
May 8, 1945: Visibility as follows: 1 a. m. 8 miles
Haze began 1400 ended 1730
May 10, 1945: Haze began 1025 ended 1930

Meanwhile, according to Mr. Goldsmith's notation, a steady southeast wind of 6–12 m. p. h. was blowing at Key West.

If conditions of visibility were such as Goldsmith describes at Key West and near-by Boca Chica, more than 50 miles from the nearest point on the mainland, they must have been far worse on the mainland itself. It is certainly reasonable to believe that birds coming north toward Florida would see ahead of them nothing but a cloud of smoke, with no land in sight, and that, under the gentle push of the southeast wind, they would gradually veer off into the clear air of the Gulf where Lowery saw them. To believe this, indeed, is much more reasonable than to believe that the three birds mentioned were engaged in a trans-Gulf flight.

Of the remaining eight birds Lowery saw on this trip, one was a Great Blue Heron flying from east to west 19 miles from the Louisiana coast, and two others were seen within 16 miles of the coast. Lowery himself mentions the fact that he saw, proportionately, many more birds near the Louisiana coast than he saw out on the Gulf. The reason for the disparity, he believes, is that the birds are tired by the time they near the coast and so descend to a lower level of flight. Curiously enough, however, the only birds that were tired enough to come aboard the ship were (with one exception) birds far out in the Gulf, not those near shore.

In summary, though the observations Lowery made on his trip across the Gulf are new and valuable, they do not prove what he wants them to prove. They prove merely that a relatively few birds appear on the Gulf of Mexico in spring.

4. Here is the crux of the whole problem. Lowery feels that the scattering of birds which he saw on the Gulf in two days indicates "trans-Gulf flights of tremendous magnitude." The evidence is minute, and the generalization is large. Lowery's trip across the Gulf and back shows merely that birds appear on the Gulf casually and fitfully, and that their presence there may often be related to abnormal meteorological phenomena. Compared with the floods of birds that go around the Gulf, those that appear on it in spring are

a mere few droplets. Their flights over the Gulf seem to be commonplace and even frequent, but not normal or abundant.

But do birds actually migrate "in floods" around the coast?

I have mentioned the multitudes of Barn Swallows on the Texas coast (in comparison to Lowery's 45 in four days on the Gulf). Here are three more instances of the same sort of thing that have come to my attention within ten days after the appearance of Lowery's article: Mr. Packard tells me that during an hour or two on a day late in April, 1946, he saw about 500 Yellow-throats in a 3–4 acre patch near Corpus Christi; on April 25, 1946, in a single thin line of low bushes about 200 yards long and about 300 yards from the surf on Galveston Island, I saw, in the space of 30 minutes, about half the species of warblers that migrate through the region, together with migrant thrushes, orioles, flycatchers, and buntings in numbers from two or three to over a hundred; on May 5, 1946, within a hundred yards of Mrs. Hagar's door in Rockport, I saw, in a little over an hour, 30 to 40 species of migrating warblers, vireos, thrushes, buntings, tanagers, orioles, and flycatchers, and (with a few exceptions) five to 20 individuals of each species.

In the following passage Griscom (1945) describes conditions as he saw them on Green Island, on the lower Texas coast, in the spring of 1943:

> I landed on the 22nd of April, and the first five minutes that I was on this island I realized that there was one land-bird migrant per cubic yard. They had presumably been flying north for several hundred miles over similar country in eastern Mexico, in the state of Tamaulipas, and this was the first green island that they had seen in some time, and they put down there in prodigious numbers. We saw warblers, vireos, thrushes, orioles, and flycatchers. There were two different kinds of hummingbirds. Most of the swallows of North America were passing overhead in a steady stream. Later in the day my friends and I went to the extreme south tip of the island, and as a matter of experiment we raised our field glasses and just looked south over the salt waters of the lagoon. We were immediately rewarded for doing so, because every thirty seconds one little flock of land-bird migrants or another would fly into the field of our glasses, and we could follow them north until they reached Green Island and pitched down into the bushes fifteen yards or so back of us. Hummingbirds, cuckoos, thrushes, warblers, orioles, finches, and grosbeaks of various kinds came in every thirty seconds to a minute during the time that we spent on the south end of the island.

Griscom believes that Green Island offers very exceptional migration phenomena; and to a certain extent he is right, for, as explained in my earlier article, birds are continually being funneled off from the coastwise route so that both numbers and species thin out along the northern sections of the coast. But it is true, I believe, that Griscom has spent only two days on islands on the Texas coast, one

day on Green Island and one on Galveston Island. If he were better acquainted with the islands, he would know that the phenomena he observed on Green Island are repeated, in a gradually diminishing scale, along every island on the coast.

I have not come across any accounts of similar concentrations along the Florida beaches—perhaps because the swampy terrain of southern Florida has prevented adequate observation, or because the generally fine weather conditions of southern Florida in spring encourage the migrants to pass without stopping. Yet a multitude of records of birds striking lighthouses on the Florida Keys proves the reality of heavy migrations across the Keys; and many years ago (1909) Commander F. M. Bennett, U. S. N., published a fascinating account that reveals something of the vastness of the migrations across the Keys. According to Bennett, on the night of April 14, 1909, a violent thunderstorm of several hours' duration blew across the Keys *from the southwest*. On that night there was an inundation of birds on all the Keys, and at the Tortugas Lighthouse they came, according to the light-keeper, "in such masses that he could not see out through the glass panes." The next day there were "millions" of birds on the island; "they were so numerous that it was difficult to walk anywhere without stepping on them."

The record is especially interesting because it shows not only the vast numbers of birds involved, but also the direction from which they probably came. A full analysis of Bennett's observations would be out of place here; but it would necessarily conclude exactly as Bennett concluded his article: "that on the night of April 14, 1909, there was an enormous flight of birds . . . making passage from Cuba or Yucatán toward the coast of Florida."

I have tried to show in this section that countless hordes of birds are known to migrate around the Gulf of Mexico. Nobody has yet shown that countless hordes migrate across it.

4. On two nights while he was in Yucatán, Lowery made telescopic observations of birds flying between him and the moon. The "path of the moon was such that the portion of the sky under observation was largely over land." He counted the birds he saw, and from their number estimated their "flight density"—that is, "the theoretical number of birds per hour passing over a one-mile line on the earth's surface at right angles to the average direction of flight." In one and one-fourth hours of one night he saw 12 birds, and in one hour the next night he saw eight birds. From the 12, he estimated a flight density of 3,710, and from the eight a flight

density of 1,960. Since Lowery makes a special point of saying (pp. 205–206) that the place where he made these observations is just like any other spot on the northern coast of Yucatán, and also that birds migrate at all times of the day, we may follow his reasoning to its logical conclusions. Since Yucatán is about 235 miles wide, Lowery would figure that 21,000,000 birds passed northward from the peninsula on the first day of his observations—on the basis of 12 birds seen! The next day 11,000,000 passed northward—on the basis of eight birds seen! Even if we ignore the many other questions involved in the observations, Lowery's method of estimating millions of birds on the basis of the minute amount of birds he actually saw is so fabulously hypothetical that I cannot see that it has any value at all.

This may be a good place for a remark about the birds Van Tyne and Trautman (1945) saw leaving the coast of Yucatán in spring. In autumn on the Texas coast I have often seen Black Terns, flying rather high, reach the Gulf from the interior of the country, dip down nearly to the water, and then fly straight south over the Gulf. Evidently, one would say, they were beginning a trans-Gulf flight. But if one watched carefully, one could see them turn to the right far out over the water, and proceed westward parallel with the coast. The two sets of observations differ in many ways, of course; but the point is that what looks like a trans-Gulf migration at its beginning may end as a coastwise migration as soon as the birds begin to lose sight of land.

I concluded my first article by saying: "There is no direct evidence to show that birds migrating from regions south of us in spring actually cross the Gulf of Mexico in any appreciable numbers; but there is abundant evidence to show that vast numbers of these birds, both individuals and species, take the coastwise routes *around* the eastern and western edges of the Gulf." Nothing in Lowery's article would make me want to change this conclusion.

Lowery, by the way, significantly misquotes (p. 180) the passage just cited. He omits the phrase "in any appreciable numbers," and thus gives a distorted version of my argument. I do not believe that he purposely misquotes; I think that, as in the rest of his paper, he is so eager to defend a preconceived theory that he unconsciously ignores what the other side has to say. It is a common human weakness; even Darwin confesses to it.

IV. Cardinal Omissions

Lowery's article omitted to mention the extremely abnormal cold wave that accompanied the appearance of birds on Howell's boat in

mid-Gulf; it omitted discussion of the Red-backed Sandpiper Howell saw; it omitted discussion of the Gray Kingbird and the Cape May Warbler seen on the Gulf, though these were obviously highly abnormal occurrences; it omitted mention of the smoke-pall that hung over Florida in early May, 1945; it omitted all but the vaguest criticism of the table around which so much of my first article was written; it omitted comparison of Burleigh's 'The Bird Life of the Gulf Coast Region of Mississippi' (December 30, 1944) with my article. (Burleigh's work will be examined in more detail a little later.)

More important, Lowery's article does not exclude the possibility, or even the probability, of his mid-Gulf birds being casuals or strays. "It is no unusual thing," says Henshaw (1901), "as every ornithologist knows, for land birds to board ships, when a greater or less distance off land, or to be seen from the decks as they wing an aimless course over the ocean."

The very number of the 'Auk' in which Lowery's article appears contains a record of a Knot 500 miles west of the tip of Ireland (in this note "south" is obviously a misprint for "west"), a Golden-Crowned Sparrow 400 miles southeast of Nova Scotia, and a Jaçana 42 miles from land (pp. 250, 255). I have not made any special study of waifs and strays at sea; but it so happens that I have a few notes on the subject taken from some early volumes of the 'Auk.' On May 8, 1885, W. J. Jeffries (1886) was on a ship about 600 miles east of New York when he made the following observations:

> I noticed a flock of Peeps on the port side, flying toward the steamer from the northwest. When within about 80 yards of us they turned to the east till they could pass our bows, then turned sharply, passing within a few yards, or even feet of us, and then off to the S. E. by E. I at once went to the upper deck to watch for more, and was surprised to find that, in every direction, as far as I could see in the then light fog, were large flocks of Peeps all flying in the same direction, S. E. by E. The birds were flying in large scattered flocks of from fifty to apparently several hundred birds. The flight lasted for nearly three hours, during which a very large number of birds must have passed us.
>
> Why were they flying S. E. by E.? They should at that season have been bound for their northern breeding grounds and not for Africa.
>
> There was not any evidence to show that the birds were lost, as all flew exactly the same way . . . Not one flock or even a single bird did I see turn to the westward to pass astern of us.
>
> They were flying strong, easily passing our steamer. Not one tried to alight, nor did any fall into the water, nor were any seen floating, though I watched carefully. Whether the Peeps were *Tringa minutilla* or *Ereunetes pusillus* I can not say.

These sandpipers at sea remind one of Lowery's Barn Swallows. Birds at sea a little closer to the coast (as was the case with so many of Lowery's birds) are recorded in an article by Leverett M. Loomis

(1901) on 'Birds Observed During a Steamer Voyage from San Francisco to Victoria, B. C.' On September 9, when he was seven miles offshore opposite the Rogue River, Oregon, Loomis saw several Mourning Doves, one of which came aboard his ship, and an Olive-sided Flycatcher which also came aboard. On the same day, when the ship was 20 miles offshore, an American Pipit and a Red-breasted Nuthatch came aboard. For September 10, Loomis reports that the ship is near Cape Flattery, and that the air is

> smoky from forest fires; the ocean without a ripple. A Sandwich Sparrow and a Yellow Warbler boarded the ship . . . Between 10 and 11 A. M., a Townsend's Warbler, a Wilson's Warbler, several Yellow Warblers, and an American Pipit sought refuge on the deck.
>
> Strait of Juan de Fuca; 2 P. M.; land hidden by smoke. A Red-shafted Flicker appeared and alighted on the stays supporting the smokestack.

This last notation is especially interesting because it suggests the smoke-pall over Florida mentioned earlier in this paper; and the entire article is interesting because it shows that either strays or coastwise migrants are fairly common at sea up to 20 miles offshore, at least.

Other random notes follow:

Young (1884) reports, for September 23, a Kestrel 500 miles west of the Irish coast; for September 24, three hawks (one of them an American Sparrow Hawk), a Pied Wagtail, and two Wheatears 1,000 miles west of Ireland; for September 25, another Wheatear, a Land Rail, and a Turnstone 800 miles east of Labrador.

Robbins (1900) reports a Maryland Yellow-throat on his ship when it was 305 miles E.S.E. of Boston, "well to eastward of a line drawn from Nova Scotia to any land on this side of the Atlantic, even Bermuda."

Henshaw (1901 and 1902) reports a Hawaiian hawk (*Buteo solitarius*) on a ship 200 miles east of Hawaii in June, another on a ship 400 miles south of Hawaii, and a Short-eared Owl 500 miles northwest of the Hawaiian Islands in October.

Helmuth (1920) reports, in the very paper that Lowery and I have haggled over so much, a Great Blue Heron 20 miles off the coast of Georgia on February 25. On the same day, when the ship was "approaching Savannah, Georgia, a Savannah Sparrow, appropriately enough, spent a few hours on the boat deck." Two days later, while the ship was about six miles offshore near Palm Beach, Florida, "a Ruby-throated Hummingbird flew over us, and a Yellow-throat was with us all day; it was joined later by a Yellow-Palm Warbler." This early in the year, none of the birds was, very likely, on a migration flight when observed.

Buckley (1945) tells of the afternoon of October 11, 1945, when his ship was "nearly five hundred miles due west of the southern California coast," and when over fifty land birds (including Flickers, White-throated Sparrows, and a small owl) came aboard, and other small birds fell into the water near the ship.

No doubt a diligent study of the literature would reveal records of numerous other birds observed at sea where they could not possibly be normal migrants, or where, if they were migrants, they were unmistakably coastwise migrants many miles from shore. It would be strange, indeed, if, during spring in a region like the Gulf of Mexico, a large number of strays and casuals did not appear far out over the water. But these strays and casuals should not be confused with normally migrating birds following the regular lanes of travel.

V. INTERPRETATION OF THE WILLIAMS ARTICLE

The present section consists of small potatoes pared rather thin. I include them only because Lowery's imputation of a dozen small errors is perhaps more subtly damaging to the thesis of my first article than the imputation of error in essential matters.

In the following paragraphs, sentences from Lowery's article are quoted, and then briefly discussed:

1. "Williams apparently failed to recognize that trans-Gulf migration and coastwise migration are not exclusive operations. To prove the one is not to disprove the other." — But the point is this: Vast spring migrations around the Gulf have been thoroughly proved; major migrations across the Gulf have not been proved.

2. "To show that some birds migrate up the coasts of Texas and México is not to show that they all do. If so, it would disprove not only trans-Gulf migration but migration up the coast of Florida as well." — My article stated very plainly, and contained a map to illustrate, that species which do not come up the México-Texas route, come up the Florida route.

3. "Because Texas, itself, is to all intents and purposes a part of the northern Gulf Coast, conclusive observations . . . can never be sought there." — Conclusive observations can never be sought in any one place, either on the Texas coast or on the Louisiana coast. And a glance at the map will show that at least one-third of the Texas coast is not a part of the northern Gulf Coast. Again and again we find blind spots like this in Lowery's logic. They are almost incredible to one who is acquainted with Lowery's careful work elsewhere.

4. "When we observe birds on the coast, there is no certain way of knowing from which direction they have arrived." — But Griscom saw them arriving from *along the coast;* I have seen them arriving from *along the coast;* I have never seen them arriving from over the Gulf. (It is quite possible, of course, that birds following the coastwise route a few miles out to sea, or birds blown out to sea from the coastwise route, might be observed coming into the coast from over the Gulf. But such an observation would not prove a trans-Gulf flight.)

5. "Williams presented a table of 56 species which purported to show that birds migrate around the sides of the Gulf. Aside from omitting a number of critical species . . ." — Species were selected for the table on what I considered the bases most fair to the opposition. The bases of selection were as follows: Oceanic species were omitted; western birds were omitted; species wintering normally anywhere in the United States were omitted so that there could be no question as to which individuals were migrants and which were winter residents; species appearing in spring in approximately equal numbers at all points along the Gulf Coast were omitted because, in the present state of our knowledge, these species prove nothing, either way, about trans-Gulf migration. This last category included rare species like the White-tailed Kite, Swallow-tailed Kite, Black Rail, Hudsonian Godwit, and Kirtland's Warbler; species and subspecies difficult for the tyro to distinguish from related forms in life, such as Baird's Sandpiper, the Crested Flycatchers, the Yellow-throated Warblers, and the Water-Thrushes; and about 20 other species, nearly half of which breed in the coastal region, and which, therefore, would appear in that region in any event.

If I had included in the table those species that winter north barely to the tips of Texas or of Florida, the tables would have been lengthened by the following: Reddish Egret, White Ibis, Roseate Spoonbill, Mississippi Kite, Black-necked Stilt, Cabot's Tern, Roseate Tern, Prairie Warbler, Palm Warbler, and Lark Sparrow. It seems probable, also, that the Mourning Warbler should be added to the list.

6. "In regard to the central Gulf Coast region especially, there is a wealth of unpublished data which renders practically every one of Williams's designations of status hopelessly misleading." — I have no way of knowing, of course, about the unpublished data Lowery has. My table was made out, for the most part, from the extremely thorough and scholarly works by Oberholser (1938) and by Howell

(1932) on the bird life of Louisiana and of Florida, from Francis Weston's long series of "Season" reports in 'Bird-Lore' and 'Audubon Magazine' concerning the northwestern arm of Florida, and from the many papers and monographs published in the early years of this century by Cooke, Chapman, and Oberholser on the distribution and migration of many groups of birds. These last, to be sure, are not to be relied upon where *negative* evidence is concerned, but their *positive* evidence is still reliable.

Burleigh's monograph on 'The Bird Life of the Gulf Coast of Mississippi (1944) fills a wide gap in our knowledge about birds in the central Gulf Coast area. It was published after my article was in print, and before Burleigh knew about my article. It may be regarded, therefore, as a kind of check on my article.

Burleigh lived on the coast of Mississippi for eight years. "During those eight years," he writes, "a detailed study was made of the bird life of the three coastal counties . . . at least eight months of each year were spent on the Mississippi Gulf Coast. This enabled me to acquire a reasonably complete knowledge of its bird life." Anyone who cares to go through Burleigh's work can see for himself how precisely his findings agree with the estimates of my own table for the central Gulf Coast area. Indeed, without looking at Burleigh, one can predict from my table almost exactly what status Burleigh will record for any bird in his work. This statement applies (with three exceptions) to the 56 birds listed in the table, and also to the 11 additional ones that winter north to the tips of Texas or Florida and come north by way of those two states. (The three exceptions mentioned are the Wood Thrush, the Gray-cheeked Thrush, and the Veery, all of which I recorded as "regularly but not frequently seen each spring" on the upper Texas coast, but which Burleigh regards as "common transients" in spring on the Mississippi coast. I do not know how to resolve the inconsistency; but it should be repeated that, though the Veery is not frequently seen on the upper Texas coast, Ludlow Griscom and I heard thousands passing over Houston early one morning, before daylight, in May, 1943.)

7. "There are notable inconsistencies in his table with respect to the lower Texas coast which L. Irby Davis has kindly supplied me (*in litt.*) regarding the status of migrant species in that region." — All the data about the lower Texas coast which appeared in my first article were culled from Mr. Davis's three spring reports published in the 'Audubon Magazine' several years ago, from Griscom and Crosby's 'Birds of the Brownsville Region, Southern Texas'

(1925–26), from the studies listed in the bibliography of the work just mentioned, from my own knowledge of the lower Texas coast near Rockport, and from the notes of various correspondents in the region.

As was pointed out in my article, one can have no adequate idea of the coastal migrations unless one is actually on the beaches or very near them. Now, I happen to know that, because of difficulties of transportation and terrain, Mr. Davis has practically no opportunity to do any birding on the outer islands of the Texas coast, and very little opportunity to do any birding on the coast itself. I recall that Mr. Griscom told me that, in his one day on Green Island, he saw either three or four species whose occurrence on the lower Gulf Coast Mr. Davis had denied.

Actually, however, Davis and Lowery question specifically the validity of only two of the 280 "designations of status" contained in my table. The two birds concerned here are the Golden-winged and the Blue-winged Warblers. Yet, in three days on the lower Gulf Coast, Griscom saw two of the former and four of the latter; nor was either species more uncommon, on those days, than the mean for 26 other species of warblers that he saw. Furthermore, Davis himself, in his three "Season" reports in the 'Audubon Magazine,' records the Golden-winged Warbler for two springs, and the Blue-winged for one.

To be sure, I do not think my table is sacrosanct, or that future investigation may not alter it in many details. But it is based on a careful study of the available literature, on reports sent to me five times a year by numerous observers on the coast during a period of over ten years, and on 14 years of regular field work by myself in the region. The exactness with which the table checks with Burleigh's monograph on the Mississippi birds is a fair demonstration of its validity.

8. "To draw up such a table on the basis of all the facts would be a gigantic undertaking that would dwarf many current works in ornithology of even broad scope." — Yet Lowery has just taken me to task because my table does not correspond to the table that he and Davis would draw up! Moreover, he himself draws up a table (Table I of his paper) in which he does exactly what he says should not be done. The same thing is true of his paper on western birds appearing in the East (1944). If he means to say that nobody knows everything about birds on the Gulf Coast, he is obviously right. Quite possibly, future observations may prove all my theories about

Gulf migration to be entirely wrong. But what I have been trying to say in this article and in the preceding one is that, *in the present state of our knowledge,* we have no right to believe that the major migration routes in spring lie across the Gulf of Mexico, and we have a good right to say that they lie around it.

9. "Williams emphasized that on the Texas coast migrants are often abundant close to shore, but that a short distance inland they are notoriously rare or absent. . . . The logical explanation lies in the principle [that] birds approaching land from across the Gulf in the face of strong adverse winds come down on the first available land and hence pile up in tremendous concentrations on coastal islands, ridges, and cheniers." — Here is the essential difference between Lowery's ideas and mine. He thinks the birds *pile up;* I think they merely *drop down.* If they piled up from a trans-Gulf flight, they would be found only along the outermost beaches fronting the Gulf. But such is not the case. They are found along the edges of the bays, too, at least in Texas. Mr. Heiser, on the west side of Galveston Bay at Kemah, 25 miles from the Gulf, and Mr. McKay near the head of Galveston Bay at Cove, 40 miles from the Gulf, find the same concentrations after bad weather that observers on the outer beaches find. The logical explanation for these facts is that the birds are following the water-line, and drop to earth when the bad weather strikes them.

10. "Our credulity now suffers a greater shock than before. Instead of struggling with one 500-mile flight, the birds must fly continuously over twice that distance if they follow the general coastline." — This is a perfectly obvious truth. But, as explained earlier, the ability of birds to fly across the Gulf has never been questioned. Lowery himself believes that they normally fly not only across the Gulf, but also, in the case of many species, continue on inland 300–400 miles. If they can fly all this distance, they can just as easily fly around the Gulf.

11. "On reaching the northern Gulf Coast [Williams] has many of them turn abruptly eastward or westward, as the case may be, and fly something like 400 miles from either direction toward the Mississippi Delta, whence again they make another abrupt right-angle turn and proceed up one of the rivers flowing into the Gulf." — I tried to explain in both the map and the table of the previous paper that birds are normally funneled off all along the coastwise routes, and that only a small percentage (many of them birds that will breed in the region) reach the Mississippi Delta. Indeed, this very matter invites further question and speculation.

I have been struck by the frequency with which all writers about birds on the Louisiana coast in spring continually repeat that *northwest* winds drive the migrants to earth. In his paper on the "coastal hiatus" (1945) Lowery says: "The weather along the coast may be highly inclement with overcast skies and fresh winds, but when the winds do not shift to the north or northwest, there is but slight precipitation of migrants" on the Louisiana coast. Speaking of his experiences on the coast in the week following April 21, 1942, he adds: "The weather conditions during the period were for the most part unsettled with occasional rains, but at no time did a 'norther' develop. There were practically no migrants." Moreover, Lowery points out (1945) that even when northerly winds have resulted in record numbers of birds on the coast, an area extending several hundred miles back of the coast has no birds. This area is the "hiatus" he mentions so often.

In contrast to what happens on the Louisiana coast, any rainy weather from any direction during the spring migratory season causes a precipitation of birds on the Texas coast. Furthermore, as was pointed out in my first article, the advancing season brings a widening of the coastal river of migration so that rainy weather then precipitates great numbers of migrants considerable distances from the coast. Thus, rainy weather on April 30 and May 1, 1945, made as many migrants show up all over the city of Houston as I have ever seen along the coast itself. Houston is 50 miles from the Gulf on the south, and more than 20 miles from Galveston Bay on the east. How much farther inland such precipitations occur, I do not know.

All these bits of evidence, together with other bits contributed by other writers, may justify us in asking the following questions:

(a.) Is it possible that the normal spring migration routes lead upward in two widening triangles from Texas and from Florida?

(b.) Is it possible that southern Louisiana, the southern half of Mississippi, and the southwestern half of Alabama lie in a triangle (with its base along the coast) in which appearances of non-breeding birds are only sporadic?

(c.) Is it possible that the "coastal hiatus" is actually nothing but this triangle lying south of the two great migration triangles leading up from Texas and from Florida?

(d.) Is it possible that (as in the case of Howell's birds in mid-Gulf) the northwest winds push the migrants of the Texas triangle eastward and southeastward to the Louisiana coast?

(e.) Is it possible that there is actually a piling up of migrants on that coast, after all—but a piling up from the west and north instead of the south, and a piling up against the sea instead of against the land?

All these questions are offered as questions, not as answers. Much work on the whole problem remains to be done; and it would be strange if either Lowery or I had already solved the problem. Yet if our little controversy inspires both of us to work more carefully, and if it encourages others to try to solve the problem, the controversy will have been worth while.

In the meantime, I see no reason why I should alter materially the conclusion arrived at in the earlier paper: The evidence shows that vast numbers of birds regularly migrate around the sides of the Gulf of Mexico in spring; there is no valid evidence to show that any large number of birds regularly migrate across the Gulf in spring.

LITERATURE CITED

BENNETT, F. M.
1909. A tragedy of bird migration. Bird-Lore, 11 (3): 110–113.

BUCKLEY, JOHN L.
1945. Land birds at sea. Auk, 63 (3): 440.

BURLEIGH, THOMAS D.
1944. The bird life of the Gulf coast region of Mississippi. Occ. Papers Mus. Zool. La. State Univ., 20: 329–490.

FRAZAR, MARTIN ABBOTT
1881. Destruction of birds by a storm while migrating. Bull. Nuttall Ornith. Club, 6 (4): 250–252.

GRISCOM, LUDLOW
1945. Modern bird study. (Harvard Univ. Press, Cambridge, Mass.)

GRISCOM, LUDLOW, AND CROSBY, MAUNSELL S.
1925–26. Birds of the Brownsville Region, southern Texas. Auk, 42 (3): 432–440; 42 (4): 519–537; 43 (1): 18–36.

HELMUTH, W. T.
1920. Extracts made from notes while in naval service. Auk, 37 (2): 255–261.

HENSHAW, H. W.
1901. Birds of prey as ocean waifs. Auk, 18 (2): 162–165.

HOWELL, ARTHUR H.
1932. Florida bird life. (Florida Department Game and Fresh Water Fish, Tallahassee.)

JEFFRIES, W. A.
1886. Sandpipers at sea. Auk, 3 (1): 131–132.

LOOMIS, LEVERETT M.
1901. Birds observed during a steamer voyage from San Francisco to Victoria, B. C. Auk, 18 (2): 201–202.

LOWERY, GEORGE H., JR.
1945. Trans-Gulf spring migration of birds and the coastal hiatus. Wilson Bull., 57 (2): 92–121.
1946. Evidence of trans-Gulf migration. Auk, 63 (2): 175–211.

McATEE, W. L., BURLEIGH, THOMAS D., LOWERY, GEORGE H., JR., AND STODDARD, HERBERT L.
1944. Eastward migration through the Gulf States. Wilson Bull., 56 (3): 152–160.
OBERHOLSER, HARRY C.
1938. The bird life of Louisiana. (Louisiana Department of Conservation, New Orleans, La.)
ROBBINS, REGINALD C.
1901. Maryland Yellow-throat at sea. Auk, 18 (1): 110–111.
VAN TYNE, JOSSELYN, AND TRAUTMAN, MILTON
1945. Migration records from Yucatan. Wilson Bull., 57 (3): 203–204.
WILLIAMS, GEORGE G.
1945. Do birds cross the Gulf of Mexico in spring? Auk, 62 (1): 98–111.
YOUNG, C. J.
1884. Notes on certain birds observed on a voyage from Liverpool to Quebec in September, 1883. Auk, 1 (4): 398–399.

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THE ROBIN NESTS

BY MINNA ANTHONY COMMON

APRIL 17.—A male and female robin were seen examining possible nesting sites. Each turned about many times in several places in two adjacent apple trees. Neither looked at the other's choices. They were not seen to go near the maples near by.

APRIL 19, 8:00 A. M.—Two female robins were seen fighting in the driveway. Soon we discovered the reason: two nests started. One foundation was laid in Fox's maple in a crotch up 25 feet. The other foundation—the first grasses—was laid in my maple by the drive, 30 feet from the 'Fox' tree. It was on a slight shelf on the bare trunk where two large branches had been recently removed.

APRIL 20, early A. M.—Nest larger in Fox's tree; still just a few dangling grasses on my tree stub-shelf.

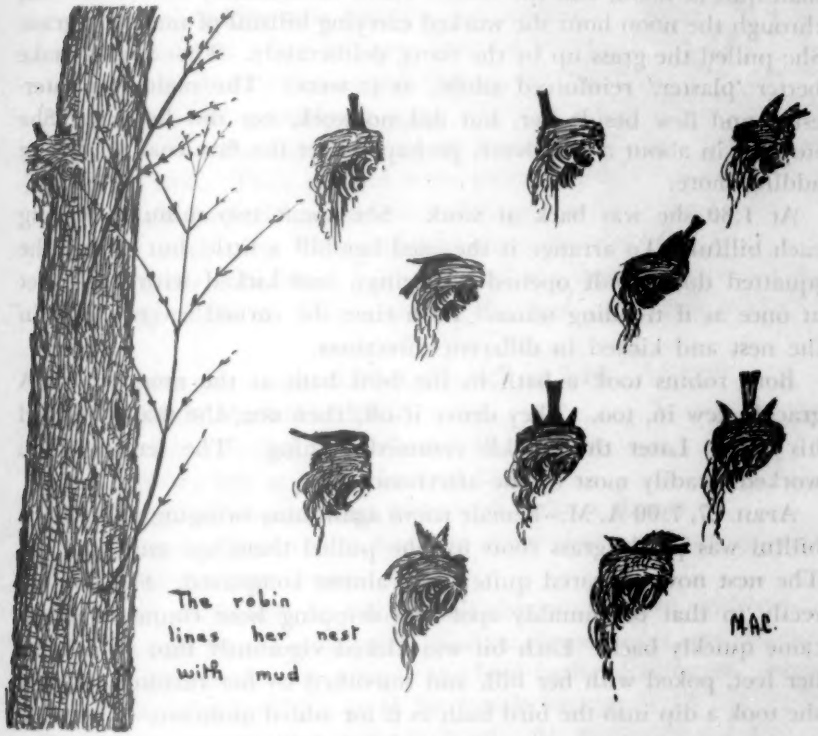
APRIL 21, early A. M.—The 'Fox' nest almost full-sized; no robins seen about during this day.

APRIL 22–23.—No activity noticed. The 'Fox' nest looked finished. The stub nest had more grasses laid, but a strong wind was blowing and some grass was drifting away now and then.

APRIL 24, 6:00 A. M.—Much work had been done on the stub nest. Grass and string hung down a foot or more and blew about. The nest was slightly cupped and the female was very busy. She would bring a rather long piece of string or grass and lay it in a coil by placing the end on the nest lining and poking it in securely, then

turning herself about while letting the rest of the string slip through her bill. Sometimes she got into the nest and appeared to kick vigorously while facing in all directions.

Systematically she robbed the 'Fox' nest. I saw her go and return many times with a billful of lining material. No robin appeared in defense.



TEXT-FIG. 1

The male stayed near, and flew with the female for material, but I did not see him do any actual work. He ate on the lawn or searched for food for himself most of the time. He did not sing.

At 8:30 her work looked very untidy. Loose grasses dangled a yard downward. At 8:45, disturbed by two cars in the drive, a peddler, and a loud rapping, she left off work; returned at 9:45. By then much of the loose material had blown away. She caught some in her bill and tucked it into place. She worked until noon. The rest of the day no robins were seen about the premises.

APRIL 25.—Quite cool. It froze last night. At 7:00 A. M., the nest shape seemed finished as far as grass, etc., was concerned. Robins did not appear all day.

APRIL 26.—No robins were seen in the forenoon. Very warm. Ground unusually dry. Today a neighbor had his hose going to spray fruit trees, and the ground became very wet near the connection. The man quit at noon, and the female robin immediately took over. All through the noon hour she worked carrying billsful of mud and grass. She pulled the grass up by the roots, deliberately. That would make better 'plaster,' reinforced adobe, as it were. The male was interested and flew beside her, but did no work, nor did he sing. She stopped in about a half hour, perhaps to let the first coat set before adding more.

At 1:30 she was back at work. She spent two minutes placing each billful. To arrange it she used her bill a little, but mostly she squatted down, half opened her wings, and kicked with both feet at once as if treading water. Each time she turned several ways in the nest and kicked in different directions.

Both robins took a bath in the bird bath at the same time. A grackle flew in, too. They drove it off; then one, the male, finished his bath. Later the grackle resumed bathing. The female robin worked steadily most of the afternoon.

APRIL 27, 7:00 A. M.—Female robin again busy bringing mud. Each billful was partly grass roots for she pulled them up, mud and all. The nest now appeared quite deep, almost completed. She flew directly to that one muddy spot—the dripping hose connection—and came quickly back. Each bit was kicked vigorously into place with her feet, poked with her bill, and smoothed by her turnings. Often she took a dip into the bird bath as if for added moisture. The male was an interested spectator.

APRIL 28, 8:00 A. M.—Still working. Now she was getting some fine, dead grasses from beneath rose bushes where it was very dry. She had used all the material in the 'Fox' nest. The side walls were now so deep the bird was almost out of sight when in the nest.

About noon, female busy bringing mud as usual. The male sat in a near-by lilac with a piece of worm in his bill. She went to the nest. He followed. Her bill was toward him. He alighted beside her on the nest rim. He held out the worm toward her. She reached up, and took one bite, then another which finished it. Then both flew away. The female worked all day. At any time we looked she was busy.

APRIL 29.—No robins in the vicinity all morning. The day was sunny and warm. At noon a grackle alighted in the nest tree. At once the male robin appeared and drove him off. (The grackle's nest was in a dense poplar 100 feet distant.)

About 4:00 P. M., my tame gray squirrel came to the house steps to be fed. The maple nest tree is only a few feet from the steps, and all winter the squirrel had been in the habit of taking his nut up to the stub, where now the nest was, to eat it. The robins made such a commotion when he came that he left without eating.

MAY 1, 5:00 A. M.—Female perched on the rim of the nest, poking something around, possibly an egg. The male came, perched on the opposite side of the nest, peering in inquisitively. She looked up, and off he flew. Then she did some more poking. He came back. This time she pecked him determinedly, and as he departed she settled down on the nest. Five minutes later she also left.

At 11:30, the male stood at the foot of the tree on the lawn, not even eating, while the female sat on the nest. At 12:20 both left. An egg?

MAY 2.—On the nest at 6:00 A. M.; left at 7:30. An egg?

On at 5:00 P. M.; left at 5:45.

MAY 3.—On at 6:30 A. M.; left at 7:30.

On at 12 M.; left at 12:30; back at 12:45.

At 1:05, chased two grackles away with quite a clamor.

On the nest all afternoon but left many times to chase grackles away. Male nowhere about.

MAY 4, 5, 6.—Female on the nest all day; no male in evidence.

MAY 7.—At 9:30, the male came, stood on the nest edge, and watched the eggs while the female went to the bird bath—15 minutes. Again male on the edge watching at 11:30; female back at 12:30. At 12:40, off again for five minutes; male at hand. All afternoon she flew off every half hour or so. Almost always the male came at once to the nest, perched on the rim, but never stepped inside. Often he seemed to be eyeing the eggs curiously. It was raining much of the afternoon, and the eggs must have gotten wet whenever she left them.

MAY 8, 9, 10, 11, 12, 13.—Each day the female sat on the nest and seldom left. When she did slip off, the male perched on the rim and peered at the eggs, one eye at a time. As she came back, he left with no waiting at all. The last two days were cool, and she stayed close. We watched but never saw any signs of the male bringing her food.

MAY 14, 15.—Warm. Female noticeably thinner.

MAY 16.—We saw the male feed the female twice, once a small green worm, once something white which the female ate in three separate bites from his bill. I think it was a piece of bread.

MAY 17.—Rain, a steady downpour. The female had her wings spread out over the nest, tail spread, and breast fluffed out in front. She made a perfect umbrella. We saw the male bring her food. She stood up to eat it, but did not leave the nest.

At 1:00 P. M., clear but cool and cloudy. The female stayed close to the nest. The male brought food several times and fed it to the young. Three bills could be seen opening. The female stood when he came, but did not leave the nest and hovered again quickly.

MAY 18.—Chilly. The female sat with wide-spread wings, occasionally stood, peered into the nest, seemed to eat something, then sat again. The sun shone on the nest in the forenoon.

The squirrel came for nuts but kept discreetly to the middle of the drive and did not even look toward the robin tree.

MAY 19.—Bills of three young were plainly seen above the nest rim. A chilly day and the mother stayed on the nest most of the time. A cat came to the foot of the tree, and the robin drove it away with fierce cries.

MAY 20.—Sunny. Both birds fed the young with small angleworms. Sometimes both came at once. The female would stay two or three minutes to brood, but the bills would appear and off she would go. The male never stepped down into the nest but fed from the rim.

We heard a commotion in the driveway. Both robins were pecking the squirrel, and how he was running! He cannot even use the drive now!

MAY 21.—A grackle hid in the syringa at the foot of the nest tree. The male robin came stalking across the lawn toward him, and the grackle left, the robin in pursuit with vicious "yawks," fierce wing noises and snaps of his bill.

The female fed the young last at 6:30, also cleaned the nest by eating the refuse. The male was not in sight from six until dark. By street light we could see him roosting in an apple tree.

MAY 22.—A gorgeous day! The mother robin almost stood up to brood the young. Their opened bills protruded in all directions.

At 8:25, the nest was apparently deserted, the young quiet; then at 8:38 a grackle came into the maple just above the nest. The male robin drove it off with a rush. The young woke up and stretched so that their heads hung out over the rim. There were three.

At 8:40, both robins came into a near-by apple tree while the young moved about in the nest but made no sound.

At 8:50, the female brought a large piece of angleworm rolled into a ball, ate the nest leavings, stood on the rim looking in. The young nestled out of sight, but occasionally stretched.

At 9:02, the female left the nest rim, sat on a branch of the maple above the nest. Grackles were heard not far away. A Chipping Sparrow sat on a branch beside the robin, singing, but she paid no attention. A dog ran by; the robin peered but made no move of attack. Two English Sparrows had a terrific quarrel in the apple tree. The robin was unconcerned.

9:15; 9:22; 9:34; 9:36.—The female brought worms and cleaned the nest. The young made no sound.

9:37.—The male brought what looked like a beetle. He had been searching the lawn, but it was so dry worms were scarce.

9:47.—The female brought food and stood on the rim three minutes.

10:00—The male brought food and stood on the rim two minutes.

10:25.—The female brought food.

11:00.—A bumblebee buzzing about the nest rim; the birds paid no attention.

11:15.—The male brought a large mouthful and fed one bird. Another was reaching up but he gave it no heed. As he left, female came and fed this other youngster.

11:55; 12:00; 12:05 (stayed four minutes); 12:20; 12:31.—Fed first three times by the female, the last two times by the male. The young were showing their bills above the rim.

The female nowhere in sight. The male rested in an apple tree, but a grackle flew out of the same tree with the robin in hot pursuit. A few minutes later the grackle came into an elm 30 feet away, but the robin drove it from there. The young were asleep and showed no activity.

3:00.—The mother bird came. One youngster spread its wings wide and came into full view, but dropped to sleep at once with neck dangling over the nest rim.

3:02; 3:10; 3:14; 3:16.—The young were fed by the female.

3:34; 3:36.—The male came and put food down the youngsters' throats.

6:55.—The female was on the nest, perched on the rim. One young perched beside her in imminent danger of falling. At 7:01, by good luck, it fell in, not out. The mother stood preening herself unconcernedly; left at 7:03. Young quiet. At 7:20 she returned and fed a large bunch of worms to one youngster and then settled down as if for the night.

MAY 23, 24, 25, 26.—Both birds busy all day. They drove the grackle away several times. The young climbed up in the nest so that they seemed in danger of toppling off. Very little noise.

MAY 27.—The squirrel was driven away by both birds with bills clacking. The young stretched often. The worms fed were balled and in huge chunks. The nest droppings were now carried off and let fall about 30 feet away.

A starling came into the maple and was not chased. Is he no longer a menace?

At 3:00 P. M. the largest youngster left the nest. It went at a 60° angle to the grapevines, 'yipped' there for an hour, and then was fed several times by the female. The others stayed quietly in the nest. In the evening the male fed the one in the vines several times.

MAY 28.—The male took over the entire care of the young that had left the nest. He kept it in bushes and low trees near the nest tree. It did not cry much, and he fed it huge billsful of worm.

The two left in the nest perched side by side on the rim. Sometimes they fluttered but by good luck fell back in. In the late afternoon it rained, and the mother bird hovered them.

MAY 29.—At 6:30 A. M., one young left; at 6:45 the other fluttered down. After they had both left, the male came to the nest with a billful of worm.

JUNE 1.—We saw the female with two young running about the lawn.

JUNE 3.—The female robin fed two young, fully grown (tails and all) in an apple tree near the nest.

JUNE 14.—A pair of robins were feeding three youngsters in the yard.

SUMMARY

On April 19, the newly-laid foundations of two robin nests were discovered high up in two maples which stood 30 feet apart. In a few days one pair disappeared, and the other female incorporated the abandoned material into her nest. The male was seen to do no work though he acted as escort, sang a great deal, and drove intruders from the vicinity of the nest. Most of the construction was done in the early morning. The nest was apparently finished on April 28.

From May 3 to 18, the female brooded all day. The male was seen to feed her a few times. If she left briefly to bathe or feed, the male guarded the nest, often from the rim. He did not brood the eggs.

From May 19 on, the male took an active part in feeding the young. He watched the young from the nest rim but never was seen to step inside, nor did he take any part in nest sanitation. On May 22, a

continuous watch was kept of the nest from 8:25 A. M. to 7:30 P. M., when the female settled down for the night. During that time the young were fed seven times by the male, seventeen times by the female. The next four days were very busy ones, and the male had no time for singing.

The first young left on May 27 and was cared for by the male. On May 29 the last two young fluttered down; the other had disappeared in the meantime. The whole group stayed about the lawn for several days, with both parents feeding and training the young.

The history of the nest comprised: 9 days nest building; 5 days egg laying; 15 days brooding; and 11 days nest feeding.

Watertown
New York

OBSERVATIONS ON THE BIRDS OF THE NORTH ATLANTIC

BY ROLLIN H. BAKER

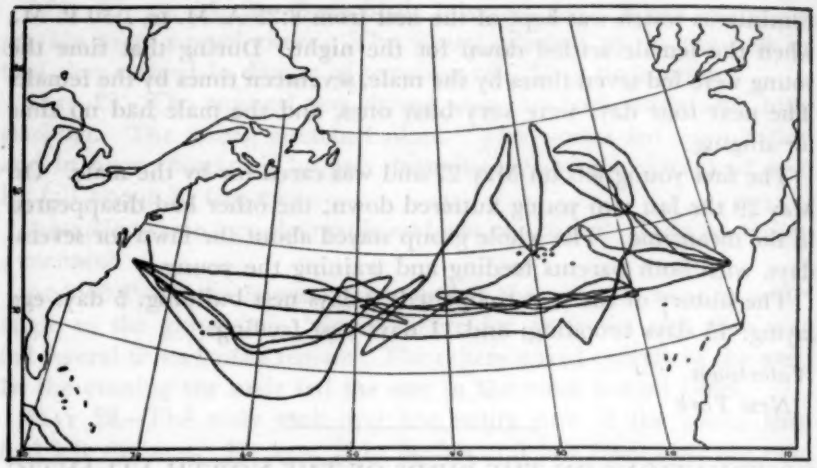
As part of my war-time duties in the United States Navy, I served on board a destroyer, which included in its operations as an escort and antisubmarine patrol vessel, several cruises into the North Atlantic Ocean. I was able to record the birds observed on voyages during the period from August, 1943, to June, 1944.

In the months from August through January, six Atlantic crossings between the United States and French Morocco were made. From February to June, trips were made in the western Atlantic as far north as New York, as far east as Bermuda, as far south as Trinidad, and as far west as Texas in the Gulf of Mexico.

BIRDS RECORDED ON TRANS-ATLANTIC CRUISES

Text-figure 1 presents the routes taken in six crossings of the Atlantic Ocean. The time occupied by each trip was about three weeks. The following dates are included: eastbound, August 7 through August 26; westbound, August 30 through September 18; eastbound, October 5 through October 27; westbound, October 30 through November 19; eastbound, December 5 through December 24; westbound, December 27 through January 18. In the longitudes of 40° W. to 75° W., birds were observed in the latitudes of 31° N. to 38° N. In the longitudes of 8° W. to 39° W., bird populations were recorded in the latitudes of 31° N. to 50° N.

There were never more than four ships in the group. This small number did not appear to be as attractive to birds as did the large cargo-ship convoys, which operated during the same period. Further-



TEXT-FIGURE 1. Routes taken on six Atlantic voyages: August through January.

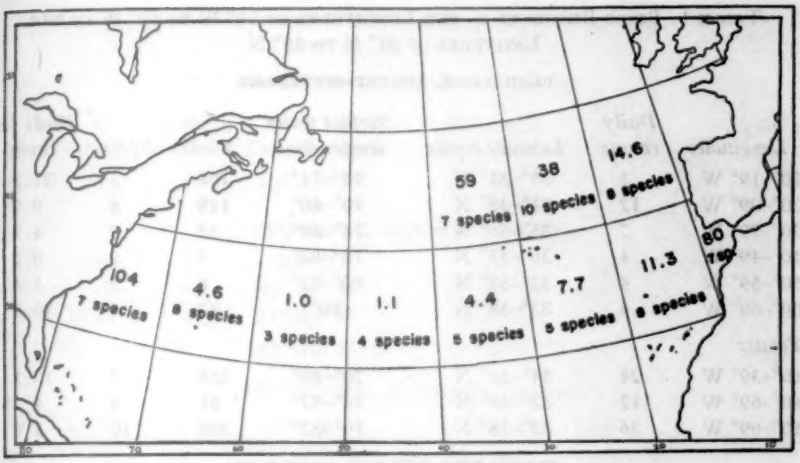
more, the ship traveled at faster speeds than cargo-ship convoys, usually between 15 and 18 knots. These factors helped to present an unexaggerated picture of the oceanic bird life.

Populations are recorded by the use of bird counts. A count consisted of a day's observation of birds, covering a period of four to six hours. A total of 111 counts were made. The location of each count was set at the point midway in the distance traveled during the period of observation. Surface water temperatures in Fahrenheit degrees were obtained on board ship, where temperatures were recorded hourly.

In Text-figure 2 is presented the number of birds seen per count in each ten-degree area of latitude and longitude visited from August through January. The total species count is also listed although these records are not too significant since a number of the birds encountered were not identified to species.

Tables 1 and 2 show bird population figures for the three periods: August–September, October–November, December–January. The longitude limits are 69° W. (about 400 miles east of the American coast at 36° N.) and 10° W. (about 240 miles west of the African coast at the same latitude). Counts made closer to the coastlines are excluded from the tables so as to present only oceanic records.

As presented in Table 1, birds seen in latitudes of 31° N. to 39° N. decreased from 8.6 birds per count in August–September to 3.1 in October–November and 1.4 in December–January. Most of this de-



TEXT-FIGURE 2. Birds observed per count on Atlantic voyages: August through January.

cline occurred in the longitudes of 10° W. to 39° W., where an average of 10.7 birds per count in the first period dropped to 7.3 in October–November and 1.6 in December–January.

In the area between 40° W. and 69° W., the average number of birds observed was 4.25 per count in the first period as compared with 1.1 in the second and third periods. The higher number found in August–September was caused by the recording of a flock of 25 storm petrels. Other than this record there were no sizable bird concentrations noted in this area. The total number of species encountered in the eastern longitudes was 13 as compared with 9 in the western ones. In the latter case most of the species were found between 60° W. and 69° W. as shown in Text-figure 2. Tropic-birds, petrels and shearwaters were the birds usually seen in the western longitudes. This area is within the region known as the Sargasso Sea, which is noted for a comparatively smaller fauna than is found at other positions in the Atlantic.

Within the latitudes of 31° N. to 39° N., the mean surface water temperature per count in the longitudes of 10° W. to 39° W. was 71.6° F. (76.5° in August–September, 70.1° in October–November, and 63.4° in December–January) while in the longitudes of 40° W. to 69° W. the mean was 75.5° (80.6° in August–September, 76.0° in October–November, and 69.1° in December–January), a difference of 3.9°. Into this colder water to the east ranged such species as

TABLE 1. BIRDS RECORDED IN THE LONGITUDES OF 10° W TO 69° W IN THE LATITUDES OF 31° N TO 39° N

Longitudes	*Daily counts*	*Latitude limits*	*Surface water temperature*	*Birds*	*Species*	*Birds per count*
PERIOD ONE, AUGUST–SEPTEMBER						
10°–19° W	5	35°–37° N	72°–74°	106	7	21.5
20°–29° W	12	34°–38° N	70°–80°	119	4	9.9
30°–39° W	7	35°–36° N	78°–80°	33	3	4.7
40°–49° W	4	36°–37° N	78°–80°	3	2	0.7
50°–59° W	4	32°–38° N	80°–82°	6	2	1.5
60°–69° W	4	33°–38° N	80°	42	4	10.5
Totals:						
10°–39° W	24	34°–38° N	70°–80°	258	7	10.7
40°–69° W	12	32°–38° N	78°–82°	51	4	4.25
10°–69° W	36	32°–38° N	70°–82°	309	10	8.6
PERIOD TWO, OCTOBER–NOVEMBER						
10°–19° W	2	34°–37° N	68°–70°	4	2	2.0
20°–29° W	2	34°–35° N	70°–72°	20	1	10.0
30°–39° W	3	34°–39° N	66°–73°	27	2	9.0
40°–49° W	6	32°–38° N	72°–78°	7	4	1.2
50°–59° W	5	33°–37° N	72°–80°	3	2	0.4
60°–69° W	4	31°–35° N	78°–80°	7	5	1.4
Totals:						
10°–39° W	7	34°–39° N	66°–73°	51	3	7.3
40°–69° W	15	31°–38° N	72°–80°	17	8	1.1
10°–69° W	22	31°–39° N	66°–80°	68	8	3.1
PERIOD THREE, DECEMBER–JANUARY						
10°–19° W	4	35°–37° N	60°–64°	14	5	3.5
20°–29° W	4	31°–34° N	62°–68°	1	1	0.2
30°–39° W	5	32°–38° N	60°–68°	6	3	1.2
40°–49° W	5	33°–34° N	66°–72°	7	2	1.4
50°–59° W	3	32°–35° N	66°–72°	3	2	1.0
60°–69° W	3	32°–35° N	66°–74°	2	2	0.6
Totals:						
10°–39° W	13	31°–38° N	60°–68°	21	6	1.6
40°–69° W	11	32°–35° N	66°–74°	12	3	1.1
10°–69° W	24	31°–38° N	60°–74°	33	8	1.4

kittiwakes and fulmars. Larger numbers of shearwaters were also noted in these waters.

As shown in Text-figure 2 and Table 2, birds were found to be much more numerous in the latitudes of 40° N. to 50° N. than in those of 31° N. to 39° N. Birds were found more frequently during the period of October–November when 64.8 birds per count were

TABLE 2. BIRDS RECORDED IN THE LONGITUDES OF 10° W TO 39° W IN THE LATITUDES OF 40° N TO 50° N

Longitudes	*Daily counts*	*Latitude limits*	*Surface water temperature*	*Birds*	*Species*	*Birds per count*
PERIOD ONE, AUGUST–SEPTEMBER						
20°–29° W	2	40°–41° N	69°–70°	16	3	8.0
PERIOD TWO, OCTOBER–NOVEMBER						
10°–19° W	1	41° N	62°	62	3	62.0
20°–29° W	6	43°–50° N	58°–64°	418	7	69.7
30°–39° W	5	42°–49° N	60°–68°	297	7	59.4
Totals	12	41°–50° N	58°–68°	777	10	64.8
PERIOD THREE, DECEMBER–JANUARY						
10°–19° W	7	41°–44° N	56°–62°	55	7	7.9
20°–29° W	8	41°–47° N	58°–60°	179	3	22.4
Totals	15	41°–47° N	56°–62°	234	7	15.3

recorded as compared with 8.0 in August–September and 15.3 in December–January.

In October to November, north of the 45th parallel, there were several large flocks of fulmars and kittiwakes. The presence of these flocks accounts for the larger total number of birds recorded in comparison with the total in more southern latitudes. Surface water was colder, ranging from 56° to 70° F., as compared with a range of 60° to 80° F. in the area directly south. There was also a larger number of species encountered in the more northern latitudes.

The presence of the Azores did not appear to be a factor affecting the fall and winter bird populations, since birds were not found to be more numerous in or near the islands. Likewise, birds were not more abundant in the vicinity of Bermuda, although there were tropicbirds and other sea birds at the island in August.

ACCOUNT OF THE SPECIES

The following is an account of the birds observed. Since most of the oceanic birds were previously unknown to me, I was unable to make positive sight identifications in some cases. Of course, there was no opportunity to examine specimens in hand. My best aid for identification was a copy of Alexander's 'Birds of the Ocean.' In all cases of questionable identity, records have been discarded.

I wish to thank Professor V. C. Wynne-Edwards for his editorial comments and Dr. Robert Cushman Murphy for his suggestions of pertinent reference material.

FULMAR, *Fulmarus glacialis* subsp.—Fulmars were encountered in large numbers during October in latitudes of 46° N. to 50° N. between longitudes of 26° W. and 31° W. A total of 345 birds were seen on five occasions. Flocks containing as many as 100 individuals were observed, often remaining in view for hours following the wake of the ship. No Fulmars were seen in December during a cruise as far north as 47° N.; however, the western limit of this trip was 26° W. The October birds were found west of this region. In January single birds were noted at two localities, 41° N. and 19° W. and 42° N. and 18° W. Surface water temperatures ranged from 58° to 62° F. in the areas where this species was found.

It is apparent from my observations that Fulmars, in large concentrations, ranged south to 46° N. in the region of 26° W. to 31° W., but probably did not reach this latitude in more eastern longitudes, except as stragglers. These observations agree with those of Wynne-Edwards (1935).

CORY'S SHEARWATER, *Puffinus kuhlii* subsp.—Cory's Shearwater was one of the most frequently observed oceanic birds. Singles were usually encountered, though occasionally as many as 10 or 15 individuals were found together. Generally the birds did not follow the wake of the ship, ordinarily paying little attention to us unless their flight was directed on a converging course with that of the ship. Their flight was swift; many times birds would cross in front or outdistance the ship at speeds of 20 to 25 knots.

TABLE 3. RECORDS OF CORY'S SHEARWATER

Month	*Birds*	*Latitude limits*	*Longitude limits*	*Water temperature*
Aug.	49	33° N to 41° N	9° W to 58° W	69° to 80°
Sept.	81	34° N to 37° N	19° W to 35° W	74° to 80°
Oct.	5	37° N to 39° N	30° W to 45° W	66° to 78°
Nov.	2	37° N	73° W	60°
Dec.	1	35° N	68° W	70°
Feb.	1	30° N	64° W	70°

As shown in Table 3, no shearwaters of this species were recorded north of 41° N. Moore (1941) records the species as far north as 50° N. in the eastern Atlantic in early fall. Most of the birds were seen in August and September, with only a few birds being found in later months. The majority were found in the eastern Atlantic. These eastern birds apparently left the area, probably moving south of 32° N., since none was recorded east of 64° W. after the middle of October. Flocks of ten or more birds were encountered in Sep-

tember, which might have been migrants. Bird concentrations were not noted the previous month. Few western records were obtained during the fall months. In November, December and February, however, four birds were seen west of 64° W.

GREATER SHEARWATER, *Puffinus gravis* (O'Reilly).—In the fall months, the Greater Shearwater was usually encountered at the northern limits of the Atlantic cruises. As far as could be determined, none was seen together with Cory's Shearwater; however, in some of the large flocks it was quite possible that individuals of both species were present. Usually the Greater Shearwater was found north of the range of the latter species.

TABLE 4. RECORDS OF THE GREATER SHEARWATER

Month	*Birds*	*Latitude limits*	*Longitude limits*	*Water temperature*
Sept.	10	38° N	61° W	80°
Oct.	273	34° N to 48° N	8° W to 36° W	60° to 70°
Nov.	14	34° N to 36° N	34° W to 38° W	72° to 73°
May	5	30° N	79° W	80°
June	8	37° N	73° W to 75° W	66°

As shown in Table 4, the majority of the birds was seen in the month of October in the region north of the Azores. Most of these 273 birds were found in flocks numbering 40 or more individuals. Usually a large flock would be encountered in a compact group on the water. They seemed sluggish and would seldom rise except when they saw that they were directly in the path of the ship. Only 14 birds were noted in November while none was recorded in the winter months.

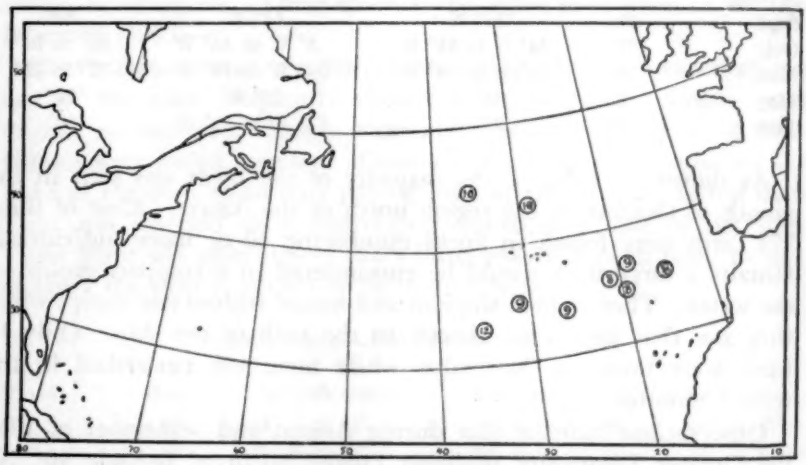
Observations indicate that during August and September of 1943 the Greater Shearwater probably ranged north of latitude 40° N., since only one record was obtained south of that parallel. This agrees with the observations of Wynne-Edwards (1935). Records for the western Atlantic are lacking. In fact, few shearwaters of any species were seen in the western Atlantic from August through October in the latitudes of 31° N. to 38° N. In October the eastern birds were found in flocks and were apparently moving south, since few birds were found in November and none in the winter months. In May and June, birds began to appear in the western Atlantic. Surface water temperatures in the region did not appear to be a factor in the movements of this species.

SOOTY SHEARWATER, *Puffinus griseus* (Gmelin).—It seems unlikely that the Sooty Shearwater was absent from areas visited; however,

no individuals that I could identify as this species were observed. It was not until April 26 that a single bird of this species was seen. This was some 40 miles off the coast of New Jersey (39° N. and 74° W.). Bent (1922) lists this species in May off the Atlantic Coast of the United States. Two more birds were seen at 28° N. and 78° W. on April 28, and on April 29 five were recorded at 24° N. and 83° W. On May 5, a concentration of about 50 Sootys was observed at 24° N.

TABLE 5. RECORDS OF THE MANX SHEARWATER

Month	*Birds*	*Latitude limits*	*Longitude limits*	*Water temperature*
Aug.	18	35° N to 36° N	15° W to 29° W	72° to 80°
Sept.	18	34° N to 37° N	19° W to 31° W	74° to 80°
Oct.	6	43° N to 44° N	29° W to 36° W	64° to 68°
Dec.	1	33° N	35° W	68°



TEXT-FIGURE 3. Distribution of monthly records of the Manx Shearwater. The numeral in each circle designates the month of observation.

and 81° W.; two more birds were seen the next day off San Augustine, Florida. On May 21, two were sighted at 39° 30′ N. and 72° 30′ W.

MANX SHEARWATER, *Puffinus puffinus* subsp.—Unlike the others of this genus observed, the Manx Shearwater was not seen in flocks. Usually one or two birds were noted, sometimes in company with other species. The smaller shearwater (*Puffinus assimilis*) was not encountered.

As shown in Table 5 and Text-figure 3, the Manx Shearwater was recorded several times during August, September and October.

Although a cruise as far north as 50° N. was made in October, birds were not seen north of 44° N. Only one winter record was obtained, observations indicating that the birds moved south of 35° N. beginning in October.

All birds were found in the eastern Atlantic; none was noted west of 36° W. All records were oceanic, usually quite remote from land. Individuals were seen in nearly all directions from the Azores, though never closer than about 250 miles from the islands. The nearest continental record was about 360 miles west of Portugal on August 31.

STORM PETRELS.—The small white-rumped petrels were the most widespread and abundant of all the oceanic birds observed. It is unfortunate that I was unable to make definite identifications of the forms involved: Leach's and Madeiran Petrels (*Oceanodroma*), Storm Petrel (*Hydrobates*), and Wilson's Petrel (*Oceanites*), although I was fairly certain that all four species were encountered at one time or another. The records presented in Table 6 show that populations dropped considerably in the winter and spring months.

TABLE 6. RECORDS OF THE STORM PETRELS

Month	*Birds*	*Latitude limits*	*Longitude limits*	*Water temperature*
Aug.	37	35° N to 41° N	18° W to 48° W	68° to 80°
Sept.	41	35° N to 38° N	19° W to 61° W	74° to 80°
Oct.	53	34° N to 46° N	15° W to 45° W	60° to 78°
Nov.	31	32° N to 38° N	28° W to 50° W	72° to 74°
Dec.	14	33° N to 47° N	16° W to 67° W	58° to 72°
Jan.	1	39° N	30° W	60°
April	3	33° N to 39° N	64° W to 73° W	44° to 68°
May	38	24° N to 39° N	68° W to 81° W	56° to 80°
June	32	37° N	73° W to 74° W	66°

YELLOW-BILLED TROPIC-BIRD, *Phaëthon lepturus* subsp.—It is probable that the yellow-billed species was the only Tropic-bird encountered north of the latitude of 25° N., while birds observed to the south on the American side may have been either the above species or the Red-billed Tropic-bird (*Phaëthon aethereus* subsp.).

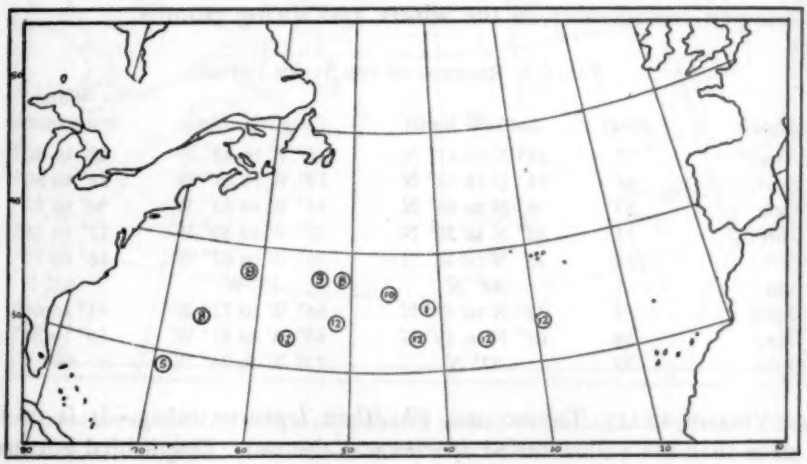
The Tropic-bird was always a pleasant bird to see. On long cruises this striking species would occasionally appear, pausing a few moments to look us over and then continue its flight. I never observed one to fly near the surface of the ocean. All would hold a steady course at elevations from 50 to 150 feet above the water.

As shown in Table 7 and Text-figure 4, there are records for the Tropic-bird as far east as 29° W. and as far north as 38° N. This agrees

TABLE 7. RECORDS OF THE TROPIC-BIRD

Month	*Birds*	*Latitude limits*	*Longitude limits*	*Water temperature*
Aug.	6	33° N to 38° N	50° W to 65° W	78° to 80°
Sept.	3	38° N	53° W to 61° W	80°
Oct.	1	37° N	45° W	78°
Dec.	8	32° N to 34° N	29° W to 57° W	68° to 72°
Jan.	1	35° N	41° W	66°
Feb.	2	13° N to 19° N	65° W	80°
May	3	22° N to 29° N	66° W to 68° W	76° to 80°

with the observations of Jespersen (1930). Records indicate that birds wandered as far east as the Azores, but that in the fall months they extended their ranges north and east more in the western Atlantic, while delaying until the winter months to move into the eastern Atlantic area. No birds (except the West Indian ones) were found west of 67° W., which seemed to indicate that—at least during the period of observations—movements between breeding seasons of birds



TEXT-FIGURE 4. Distribution of monthly records of the Yellow-billed Tropic-bird.

from Bermuda and other American nesting places were southward, northward and eastward into the region of the Sargasso Sea rather than toward the North American mainland. The western edge of the Gulf Stream might act as a barrier. Most of the birds were recorded in areas where surface water temperatures were 76° to 80°; only six birds were found where temperatures ranged from 66° to 68°.

With the exception of the West Indian records and the one from near Bermuda, all birds were found at great distances from land.

The most eastern record was directly south of the Azores at 34° N. and 29° W. on December 14. Others were at 33° N. and 35° W. on December 12 and at 35° N. and 41° W. on January 11. No records of the Red-billed Tropic-bird were obtained in the eastern Atlantic. These eastern records are probably for White-tailed Tropic-birds from western Atlantic breeding areas but could conceivably be for individuals of the subspecies (*Phaëthon lepturus ascensionis*) which breeds on Ascension and other islands on the African side below the Equator.

NORTHERN GANNET, *Sula bassana* (Linnaeus).—Gannets were encountered along the eastern coast of the United States from November through April, as far south as latitude 37° N. (off Norfolk, Virginia). Birds were found from 15 to 200 miles off the coast, ranging apparently as far east as the western edge of the Gulf Stream, in water that had a surface temperature from 38° to 60°. The birds were observed to be fast flyers, often flying at 25 knots to overtake our ship. Singles, as well as flocks numbering as many as 50 individuals and containing both adults and juveniles, were seen. The earliest record was on November 19 at 37° N. and 73° W., and the last spring record was on April 26 at 39° N. and 74° W. Both localities were visited on several occasions by the ship prior to and following these dates.

In the eastern Atlantic, gannets were found on three occasions. On October 25, an immature bird was seen at 41° N. and 18° W., about 500 miles west of Portugal. On December 24, six birds were sighted at 37° N. and 12° W., about 180 miles west of the coast of southern Portugal. On December 29, a single bird was noted at 42° N. and 18° W. These eastern records were taken in areas where the surface water temperature ranged from 58° to 62°.

GREAT SKUA, *Catharacta skua* subsp.—The Skua was seen five times during the months of October, December and January. All observations were recorded north and east of the Azores in latitudes ranging from 37° N. to 45° N. between the longitudes of 12° W. to 23° W. The birds were encountered at great distances from land, except for one record on December 24 when four birds were sighted about 180 miles west of Cape St. Vincent, Portugal. This large and conspicuous sea bird was usually seen in company with other birds of the region, including fulmars, kittiwakes and jaegers. In the areas where this bird was found the surface water temperature ranged from 56° to 62°.

POMARINE JAEGER, *Stercorarius pomarinus* (Temminck).—It is possible that other species of jaegers were encountered, but I saw no

birds that could be definitely distinguished as the Long-tailed or the Parasitic Jaegers.

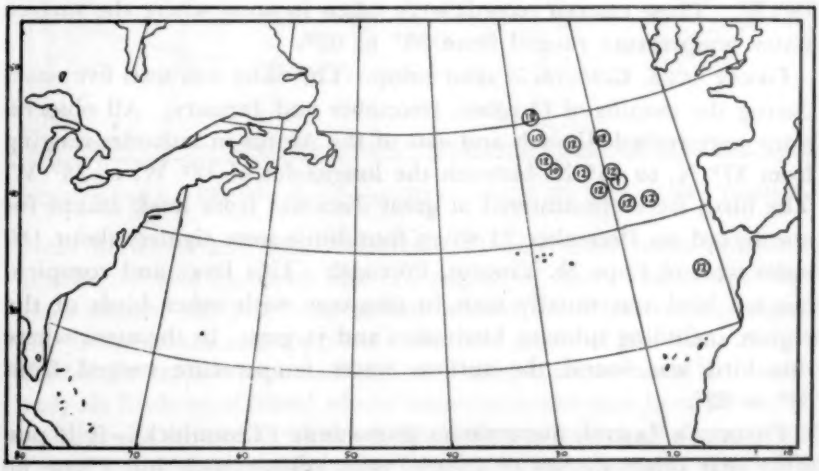
The Pomarine Jaeger was found principally in the region north of the Azores. Most of the records were obtained in October, during which month 19 birds were found in latitudes of 34° N. to 49° N. between the longitudes of 8° W. and 33° W. All but two of the birds were recorded north of 43° N. In November, ten birds were seen at 37° N. and 73° W. and a single bird at 34° N. and 46° W. In December, two individuals were counted at 42° N. and 16° W. Surface water temperatures in areas where the jaeger was seen ranged from 58° to 72°.

Most of the records were obtained at great distances from land, although on October 30, two birds were seen some 50 miles west of Casablanca, French Morocco. Also, on November 19, ten birds were sighted about 130 miles east of Norfolk, Virginia. The last record was the only one obtained in the western Atlantic; all others were noted east of 46° W.

ATLANTIC KITTIWAKE, *Rissa tridactyla* subsp.—Like the Fulmar, the Kittiwake was found during the extended patrols north of the Azores. Flocks were encountered numbering from 10 to 100 individuals and

TABLE 8. RECORDS OF THE ATLANTIC KITTIWAKE

Month	*Birds*	*Latitude limits*	*Longitude limits*	*Water temperature*
Oct.	80	46° N to 50° N	26° W to 28° W	58° to 62°
Dec.	191	35° N to 47° N	12° W to 26° W	58° to 64°
Jan.	20	44° N	18° W	56°



TEXT-FIGURE 5. Distribution of monthly records of the Atlantic Kittiwake.

containing both adult and juvenile birds, and often in company with other species.

As presented in Table 8 and Text-figure 5, 80 birds were seen in October ranging from 46° N. to 50° N. in longitudes of 26° W. to 28 W°. In December, 191 Kittiwakes were counted in latitudes from 35° N. to 47° N. and longitudes of 12° W. to 26° W. All birds except two were found north of the 42nd parallel. The exception was on December 27 when two birds were noted at 35° N. and 12° W., about 250 miles west of Casablanca, French Morocco. This isolated record was also the one nearest land. In January, 20 birds were seen at 44° N. and 18° W. No records were obtained west of 28° W.; however, in the western Atlantic, cruises were made no farther north than 39° N., except in the area adjacent to New York harbor (41° N.).

BIRDS SEEN IN AMERICAN WATERS

The following accounts are of birds observed in the waters adjacent to the American coast and in the West Indian area.

BROWN BOOBY, *Sula leucogaster* subsp. — On February 18, eight Brown Boobies were seen in the Caribbean Sea at 65° 30′ W. and 30° 30′ N.

BLUE-FACED BOOBY, *Sula dactylatra* subsp.—Two Blue-faced Boobies were noted in the Caribbean Sea at 65° 30′ W. and 30° 30′ N. on February 18.

FRIGATE-BIRD, *Fregata magnificens* subsp. — Frigate-birds were encountered on two voyages in the West Indian area. In February, birds were recorded near San Juan, Puerto Rico (19° N. and 65° W.), in the Caribbean Sea at 16° N. and 64° W. and at 13° N. and 65° W. On May 1, two birds were seen at the approaches to Galveston Bay, Texas (29° N. and 95° W.) and one in the Straits of Florida, May 5.

SOOTY TERN, *Sterna fuscata* subsp. and

BRIDLED TERN, *Sterna anaethetus* subsp.—Both species of terns were undoubtedly encountered during cruises in the West Indies. In February, large flocks of 50 or more birds were sighted in the Caribbean between the latitudes of 13° N. and 15° N. and the longitudes of 65° W. and 70° W. The birds were very noisy and on several occasions were heard flying overhead at night. In April, about 150 birds, comprising several flocks, were counted between Florida and the Bahamas at 28° N. and 78° W. and off the Florida Keys. In May, flocks were found in the Straits of Florida, between Puerto Rico and the Virgin Islands, and on May 6, a flock of 25 was noted some 40 miles east of San Augustine, Florida. No birds were seen west of the Florida Keys in the Gulf of Mexico.

BROWN NODDY, *Anous stolidus* subsp.—Flocks of these birds were seen on April 29 and May 5 in the Straits of Florida.

OSPREY, *Pandion haliaetus* subsp.—Land birds were often visitors to our ship, especially in the West Indian area. The record of an Osprey some 200 miles northwest of Bermuda seems noteworthy. A single bird rested on our mainmast for several hours on October 7 at 35° N. and 68° W. Apparently this bird was migrating in the direction of Bermuda. It has been recorded there by Bradlee, Mowbray and Eaton (1931) as an occasional autumn and winter visitor.

MOURNING DOVE, *Zenaidura macroura* subsp.—On October 6, a Mourning Dove flew by the ship at 35° N. and 69° W., which is about 240 miles northwest of Bermuda. It is recorded in the list of Bermuda birds by Bradlee, Mowbray and Eaton (1931).

FLORIDA GALLINULE, *Gallinula chloropus* subsp.—A single Florida Gallinule was observed on April 28, apparently flying from the eastern coast of Florida to the Bahamas; at least that was its direction of flight. When seen, the bird was about 25 miles northwest of Grand Bahamas Bank.

BOBOLINK, *Dolichonyx oryzivorus* (Linnaeus).—A Bobolink rested for a short time on the forecastle of the ship on May 7. This location was about 150 miles east of Norfolk, Virginia. The bird was in breeding plumage.

SUMMARY

While on duty on board a United States destroyer, the writer was able to record the birds observed during the period from August, 1943, to June, 1944, on cruises into the North Atlantic, the Caribbean and the Gulf of Mexico.

In the months of August through January six crossings of the Atlantic were made, during which time birds were recorded in the latitudes of 31° N. to 50° N.

In the latitudes of 31° N. to 39° N., birds were found to be more abundant in the eastern longitudes (10° W. to 39° W.) and less numerous in the western longitudes (40° W. to 69° W.). This latter area is within the region known as the Sargasso Sea. Within these latitudes, bird populations in the western longitudes remained rather constant through the fall and winter months while there was a considerable reduction in numbers in the eastern longitudes from a high of 10.7 birds per count in August–September to a low of 1.6 birds per count in December–January. Movement of shearwaters out of the region was the apparent reason for this decrease. The average surface water temperature taken during bird counts in the eastern longitudes was found to be 3.9° F. colder than in the western longitudes.

Birds were found to be much more numerous in the latitudes of 40° N. to 50° N. as compared with the latitudes of 31° N. to 39° N. directly to the south. The presence of more northern species in this colder water area is apparently the reason for the difference in population densities.

A list of the birds, together with notes on distribution and abundance, is given.

BIBLIOGRAPHY

ALEXANDER, W. B.
1928. Birds of the ocean: 1–428, illus.

BENT, A. C.
1919. Life Histories of North American diving birds. **Bull. U. S. Nat. Mus.**, no. 107: 1–245, pls. 1–55.
1921. Life histories of North American gulls and terns. **Bull. U. S. Nat. Mus.**, no. 113: 1–345, pls. 1–93.
1922. Life histories of North American petrels, pelicans, and allies. **Bull. U. S. Nat. Mus.**, no. 121: 1–343, pls. 1–69.

BONHOTE, J. L.
1903. On a collection of birds from the northern islands of the Bahamas group. Ibis, (ser. 8) 8: 273–315.

BRADLEE, T. S., MOWBRAY, L. L., AND EATON, W. F.
1931. A list of birds recorded from Bermuda. **Proc. Boston Soc. Nat. Hist.**, 39: 279–382, pls. 43–45.

FORBUSH, E. H.
1925. Birds of Massachusetts and other New England states. Pt. 1: 1–481, numerous pls. and drawings.

JESPERSEN, P.
1930. Ornithological observations in the North Atlantic Ocean. **Danish 'Dana' Expeditions 1920–22, Oceanographical Reports, no. 7: 1–36, figs. 1–19.**

MAYAUD, NOEL
1937. Nouvelles données sur l'ornithologie des Açores. **Alauda, 9: 313–330.**

MOORE, HILARY B.
1941. Notes on the distribution of oceanic birds in the North Atlantic. **Proc. Linn. Soc. N. Y., 52–53: 53–62.**

MURPHY R. C.
1936. Oceanic birds of South America, 1: 1–640; 2: 641–1245, illus.

MURPHY, R. C., AND CHAPIN, JAMES P.
1929. A collection of birds from the Azores. **Amer. Mus. Novit., no. 384: 1–23.**

NICHOLSON, E. M. AND NICHOLSON, B. D.
1931. An ornithological transect of the North Atlantic. **Brit. Birds, 24: 266–274,** pl. 3.

WYNNE-EDWARDS, V. C.
1935. On the habits and distribution of birds on the North Atlantic. **Proc. Boston Soc. Nat. Hist., 40: 233–346, pls. 3–5.**

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NESTING STUDIES OF THE BLACK-BILLED MAGPIE IN SOUTHERN IDAHO

BY FRED G. EVENDEN, JR.

THE name of Mountain Home, Idaho, where these studies were made, is very misleading. The town, itself, is situated approximately 50 miles southeast of Boise, Idaho. The general topography is a plateau, sloping gradually from the foothills in the north to the Snake River Canyon in the south. Mountains directly north go to 7,500 feet elevation, but the 25 miles of distance from the foothills, south to the river, goes from 3,300 feet elevation to approximately 2,900 feet at the rim of the canyon. A few streams meander through this region, but they are dry, except in the very wettest seasons of the year. Few trees are native to this plateau area, but sagebrush forms a not too uniform blanket over the slightly undulating surface of the plateau. Scrubby willows will be found growing where there is sufficient moisture to support them. The winters are cold, the summers are hot, and the rainfall is slight.

The material on the magpies was gathered from two different sites near Mountain Home, which were the only nesting concentrations within six miles of the town.

AREA 1

The first area was just a quarter of a mile from the southern edge of town. It consisted of a patch of sagebrush and rabbit-brush of approximately five acres. A nearly stagnant creek meandered through the area. A growth of willows and an occasional hawthorn could be found along the course of the stream. During the summer the stream was completely dry, even though there was a current flowing during the winter and spring.

In this area there were between 35 and 40 adult birds. On April 17, 1944, we found and recorded the following data on 16 nests:

Nest	*No. of eggs*	*Height of nest, etc.*	*Vegetation type*
1	6	4½ ft. (over water)	hawthorn
2	2	5 ft. (over water)	willow
3	8	6 ft. (over water)	sagebrush
4	8	4½ ft. (over water)	willow
5	7	4 ft. (over water)	willow
6	6	4 ft. (over water)	willow
7	6	6 ft.	willow
8	6	5 ft.	willow
9	7	6 ft. (old crow's nest)	hawthorn
10	6	5½ ft.	willow
11	6	3 ft.	?——?

Nest	*No. of eggs*	*Height of nest, etc.*	*Vegetation type*
12	6	4 ft.	willow
13	8	6 ft.	willow
14	6 (small)	4½ ft. (open on top)	willow
15	7	7 ft.	willow
16	4	4 ft.	willow

The total number of eggs in the sixteen nests was 99. The average height of the nests was approximately 5 feet (4.93 ft.). The measurements were made to the top rim of the inner nesting cup.

From the above table it can be seen that 12 of the 16 nesting sites were placed in willows, two were placed in hawthorn, and only one nest was found in sagebrush. One shrub chosen as a nesting site still remains unidentified.

The presence of water, temporary as it may have been, seems to have had a dominant influence in the location of the nests, for 75 per cent of the nesting sites were in willows, and they were found only close to the water channel. Even those nests in the sagebrush and hawthorn were over water, with the exception that the one in the old crow nest was a few feet back from the water.

Thorough examination of the sagebrush area away from the watercourse failed to reveal other nests. A few more nests were due to be constructed later in the season, for it was quite evident that the total population of magpies in this area was not nesting at the time we were there.

This area was heavily infected with western wood ticks (*Dermacentor andersoni*), and they were found frequently in the nests (probably accidental occurrences), but never on the birds. We did find examples of dipterous maggots working their way out of the abdomens of young birds when we visited the area a few weeks later.

Several dead adults or, rather, parts thereof, were found from time to time throughout the area. Some had been shot by boys with .22 rifles, but others had met their fate at the hands of the Marsh Hawks and coyotes that frequented the area.

By the last of May, most of the young had left the nest, and almost every bush in the area held its share of young magpies.

The first area served for verification of the data gathered in the area next to be described.

AREA 2

The second area was three and one-half miles northeast of the town. It was in a shallow valley which had been converted into a reservoir by placing a rock and dirt dam across the lower end of it. At full capacity the water surface would cover about 100 acres, but during

low-water times, the upper end was out of the water, and it was here that a dense growth of willows was situated. The tallest willows were not over ten feet high. A dry stream channel meandered through this part of the reservoir area, and although the willows covered a considerable portion of this area, all nests were found within 100 feet or so of the dry stream channel.

Our first visit to this area was made on April 7, 1944. On that date we found two nests with three and four eggs in them, four nests just being built, and one old nest (which later was to be remodeled and occupied). Visits were made regularly every five days thereafter.

Nest 1.—This nest was in a dead willow, at a height of four feet. There was a full set of six eggs in it on April 12, and on April 27 the female stayed on the nest until I looked into it, for there were four young and two eggs. The young apparently were about two days old, as we judged from later experience. All four young were of approximately equal size, possibly indicating that incubation did not begin until the set was nearly completed. As there were four eggs in the nest on April 7, and on the 27th we found the four two-day-old young, it would appear that there was an 18-day incubation period for this nest. No sign of egg shells was ever found in or around the nest or on the ground. Every time I visited the nest during the incubation period, the same bird was on the nest. This could be told easily for it had the left tarsus badly damaged. The other bird of the pair, presumably the male, was usually close by, and when I would flush the female from the nest, he immediately joined her in scolding and trying to chase me away.

On May 2, the other two eggs had hatched, and the young were considerably smaller in size than the four young that hatched several days ahead of them. By May 17, the young had reached the point of development where they were ready to leave the nest, and when I returned on May 28, they had been gone for some time.

Nest 2 was found in a rose bush at a height of two and one-half feet. It held three eggs on April 7 and a full set of eight eggs on April 12. It would seem that one egg was laid each day from the 7th to the 12th. On May 2, the female stayed on the nest until I looked into it, for there were seven young and one egg in it. Judging by the rate at which the eggs were laid, that egg supposedly would have hatched on May 3, giving a minimum incubation period, at least for that one egg, of 21 days. It may have been more, but our visits were not frequent enough to determine it. The eighth egg had hatched when we visited the nest on May 7. All eight young

had left the nest by May 28. Even after leaving the nest, they stayed fairly close in the bushes near the original nesting site. When they first left the nest they usually could fly only a very few feet.

Nest 3 was placed in a live willow at 44 inches height. The nest was under construction on April 7, had one egg on April 12, four eggs on April 17, and the set of six eggs on April 22. When we visited the nest on May 7, there were six young in the nest, apparently from one to two days old. All were of the same size, so incubation presumably began between the 17th and the 22nd, and hatching was completed by May 7. In this case the incubation period would have been at most 17 days, and could have been as low as 14 days if an egg was laid every other day, as seemed to be indicated—that is, on April 11, 13, 15, 17, 19, and 21, with incubation beginning April 21. The uniform size of all the young seemed to indicate that the eggs were all equally incubated. Incubation included nine days in April and five in May, for on May 7 the young were about two days old, as mentioned above. On May 28 they were on the edge of the nest and in the same bush as the nest, all ready to leave.

Nest 4 was placed five feet above ground in a live willow. It was under construction on April 7, but on April 12 there were three eggs in it. On April 17 there were *no* eggs in it, and there were none in it as long as I continued to visit it every five days. On April 17 I found that an old nest had been remodeled (*Nest 7*) in which there were three eggs. All this had taken place since my visit on the 12th. Could the three eggs from the original nest have been carried by the parent birds into the hurriedly remodeled nest? The distance between the nests was about 250 feet. It seems to me quite logical that this could have been done, for it seems unlikely that all the events could have been crowded into the five days, except by moving the three eggs to the new nest. The new nest was placed in a dead willow three feet above ground. It certainly was not a new pair of magpies, for there were only six nesting pairs in the area. The original nest was placed in a willow which was by itself in an open situation, and perhaps these birds learned the advantage of having the nest sheltered. On April 22 the remodeled nest had five eggs in it, and on May 12 there were four young and one egg in the nest. The young were of equal size and had been hatched for about three days. On May 17 there were still four young and one egg; and on May 28 there were *three* young and one egg, the young about ready to leave the nest. When I last visited the nest on June 15, there were no young and no eggs. What happened to the one young be-

tween May 17 and 28, I do not know, but the unhatched egg may have been damaged in transferring it from one nest to another. Incubation began at least by April 22, and the eggs hatched about May 9, giving a total of at least 17 days. Incubation may have been started as early as April 19 or 20, which would have given even 19 or 20 days for the incubation period. If three of the eggs were the same ones that were laid in nest four, it means that two or three of them were a month in hatching.

Nest 5 was at a height of two and one-half feet in a rose bush. It was under construction on April 7, had four eggs in it on April 12, and a set of seven eggs on April 17. On May 2 there were four eggs and three young in the nest. On May 7 there were seven young. On May 28 there were only two young in the nest; the other five had left. On May 2, the three young were one or two days old, and on the basis of an egg laid each day, as appeared to be the case here, the incubation period was exactly 18 days for this nest.

Nest 6 was in a live willow at a height of three feet. It was under construction on April 7 and was completed on April 12. There was one egg in it on April 17, there were two eggs on April 22, and four eggs on April 27. Exactly four eggs were laid over at least a ten-day period. On May 12 there was one young in the nest, and there were *two* eggs. On May 17, there were still one young and two eggs, and on May 28, one young and *no* eggs. On June 15 the nest was empty, and the young one had left. This again was an example of a young pair of birds nesting, for this nest was in an open site, as was Nest 4. In all the times I visited this nest with the single young in it, I never flushed a parent bird off the nest, although the parents must have been taking care of it, for it continued to grow and eventually left the nest. I rather suspect they were busy elsewhere most of the time, for 55 or 60 feet away, across the dry stream channel mentioned before, a quite new nest (Nest 8) was started on April 22, which was completed on April 27. This nest was in a dense willow clump at a height of two and one-half feet. On May 2 there was one egg in the nest, but on May 7 there was *no* egg. However, on May 12 there were three eggs in the nest, and on May 17 there were seven eggs. When I last visited the nest on June 15, the young were within a week of flight from the nest. The conditions were so mixed with regard to these last two nests that I shall not try to hazard an estimate on the length of the incubation period for either of them. This pair of birds certainly had a difficult time in getting a successful nesting, but they finally succeeded. It would be interesting to

know what happened to the egg that had unaccountably disappeared when I visited the nest on May 7, and also what happened to either one egg or one young in this pair's first nest between May 7 and 12. The only way events of this type could be accurately traced would be by visiting the nesting area daily, rather than every five days, the way we did.

TABLE OF NESTINGS IN AREA 2

Nest	*Apr. 7*	*Apr. 12*	*Apr. 17*	*Apr. 22*	*Apr. 27*	*May 2*	*May 7*	*May 12*	*May 17*	*May 28*	*June 15*
1	4 e	6 e	6 e	6 e	2 e 4 y	6 y	6 y	6 y	6 y	m	m
2	3 e	8 e	8 e	8 e	8 e	1 e 7 y	8 y	8 y	8 y	m	m
3	n	1 e	4 e	6 e	6 e	6 e	6 y	6 y	6 y	6 y t	m
4	n	3 e	o	o	o	o	o	o	o	o	o
5	n	4 e	7 e	7 e	7 e	4 e 3 y	7 y	7 y	7 y	5 g 2 y	m
6	n	c	1 e	2 e	4 e	4 e	4 e	?2 e ?1 y	?2 e ?1 y	1 y	m
7	o	o	r 3 e	5 e	5 e	5 e	5 e	1 e 4 y	1 e 4 y	1 e 3 y	m
8	—	—	—	n	c	1 e	?0 e	3 e	7 e	7 e	7 y x

e—egg or eggs
y—young
n—building new
c—completed
r—remodeled
o—old nest
m—empty
t—ready to leave the nest
g—gone
x—1 week before leaving nest

SUMMARY

A total of six pairs of birds built and occupied eight nests during the season. One of the nests was completely abandoned, and another was only partially maintained. In both nesting failures, the nests were situated in open sites, and could well have been the first nesting attempts of two pairs of birds hatched the previous nesting season.

These six pairs laid a total of 43 eggs, with five of the eggs failures. This assumes that the three originally laid in Nest 4 were transferred to Nest 7. For the six satisfactorily completed nestings, the average number of eggs was 6.50. In comparison, the 16 nests in the other nesting area we studied had a total of 99 eggs, for an average of 6.187 eggs per nest.

The average height of the nesting cavities for the six nests was 3.25 feet, in contrast to an average height of 4.93 feet for the nests in the other nesting area. Height of available vegetation in the two areas was about equal.

The mean incubation period for five of the nests is 18 days with the extremes from 14 to 21-plus days. Data from the other nests were too unreliable to use.

It has already been mentioned that only one bird appeared to incubate. The bird's mate was, however, always near by. After the young were hatched, and up to the time when they began to feather out, a parent bird was always found on the nest, remaining on it until we were at the edge of the nest, looking into it.

From the data gathered it seems to take from three to four weeks, after hatching, for the young to leave the nest.

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RECENT OBSERVATIONS ON MARYLAND BIRDS

BY ROBERT E. STEWART AND CHANDLER S. ROBBINS

IN the course of working on a study of the 'Geographical and Ecological Distribution of the Birds of Maryland,' a considerable number of records of occurrence have been obtained, which have helped to clarify the status of many Maryland birds. Some of these records are new for the state and many serve to extend the known breeding or wintering ranges within Maryland. Others will serve as additional information on the seasonal and geographical distribution of certain species whose ranges are imperfectly known.

This study was started in earnest in the early summer of 1945, although a few field trips had been taken before this date. During this period, several people from the Audubon Society of the District of Columbia, the Maryland Ornithological Society, and the Patuxent Research Refuge accompanied us from time to time and contributed to the observations.

Most of the more interesting information derived from the records obtained in this study is included in the following annotated list. An asterisk (*) indicates that there is no previous published record for Maryland.

RED-THROATED LOON (*Gavia stellata*).—Although this species is a regular winter resident along the coast of Maryland, its presence during the summer was unexpected. On August 5, 1945, three birds in non-breeding plumage were observed on Sinepuxent Bay about two miles south of Ocean City.

WILSON'S PETREL (*Oceanites oceanicus oceanicus*).—Nine Wilson's Petrels were observed on Chincoteague Bay on July 3, 1945. These birds, including one that was collected, were seen near the center of the bay at least a mile from the nearest island.

On this trip, our guide, Mr. H. D. Foulks, a man in his fifties, who is a native of the region and who has spent most of his life working on the bay, informed us that although he had seen this species (Mother Carey's chickens) offshore, he had never found it on the bay until two days previous to our visit. These birds were undoubtedly blown in by the tropical hurricane of June 26.

BROWN PELICAN (*Pelecanus occidentalis*).—Mr. Ethan A. Carey of Berlin, Maryland, has a mounted specimen of a Brown Pelican that he shot about twenty-five years ago near the Isle of Wight Coast Guard Station north of Ocean City. He reports seeing single birds on two occasions since that time. This species was previously recorded by Dr. Clarence Cottam and F. M. Uhler on May 22, 1935, when a flock of four was seen near Ocean City (Auk, 52: 460, 1935). One also was seen by Dr. W. B. Truitt at Solomon's Island, Maryland, on October 10, 1936.

AMERICAN EGRET (*Casmerodius albus egretta*).—During 1945 and 1946 a considerable number were found nesting in a mixed colony of herons, located on the south end of Mills Island on Chincoteague Bay. Another group is evidently nesting along the Pocomoke River near the Delaware line, since a large numnber of birds were observed here on June 15, 1946.

SNOWY EGRET (*Leucophoyx thula thula*).—During 1946 a large number were found nesting in the mixed heron colony located on the south end of Mills Island. A much smaller number, comprising not more than six pairs, were also found nesting with Little Blue Herons (*Florida caerulea*) and Black-crowned Night Herons (*Nycticorax nycticorax*) about one mile west of Ocean City. Still another colony appears to be situated along Chesapeake Bay near Crisfield, in Somerset County, as a considerable number of birds were observed in this area on June 12, 1946.

LOUISIANA HERON (*Hydranassa tricolor ruficollis*).—In July, 1946, at least three pairs were found nesting in the mixed heron colony located on the south end of Mills Island. On August 29, 1945, two birds were seen feeding in the salt marsh bordering Assateague Island about three miles south of Ocean City. Kirkwood (Birds of Maryland, 1895) states that a specimen was taken "in Maryland" in 1868 or 1869 and preserved in the Maryland Academy of Sciences. There is also a sight record for Scotland Beach, St. Marys County, on August 18, 1928 (Ball, Auk, 47: 94, 1930).

LITTLE BLUE HERON (*Florida caerulea caerulea*).—During the summer of 1946, large numbers were found nesting in a colony located one mile west of Ocean City, and also in the mixed colony located on the south end of Mills Island.

YELLOW-CROWNED NIGHT HERON (*Nyctanassa violacea violacea*).—The existence of colonies of Yellow-crowned Night Herons along Seneca Creek, in Montgomery County, has been known for several years by some of the Washington, D. C., ornithologists including Mr. E. J. Court and Mr. Ralph E. Lawrence. In 1946, at least one pair was found nesting in the mixed heron colony located on the south end of Mills Island. On July 13, 1946, a single adult was observed on Assateague Island, about nine miles south of Ocean City.

AMERICAN BITTERN (*Botaurus lentiginosus*).—This species, which nests somewhat sparingly in many of the tide-water marshes of the state, was recorded on January 18, 1946, when one bird was flushed from the salt marsh bordering Isle of Wight Bay, about one mile north of Ocean City.

HOODED MERGANSER (*Lophodytes cucullatus*).—On June 21, 1946, a female with a brood of eight half-grown young was observed in the Cherry Creek Swamps in Garrett County, about three miles east of McHenry.

RED-BREASTED MERGANSER (*Mergus serrator*).—At least two small flocks, comprising five or six individuals each, were found to spend the entire summer of 1945 in

Sinepuxent Bay. These birds were in the female or immature plumage and all seemed active and healthy. A few scattered singles, including one seen near Parson Island in Chesapeake Bay, may have been cripples.

BLACK VULTURE (*Coragyps atratus*).—Black Vultures are largely restricted to the coastal plain of "Southern Maryland" (western shore coastal plain) and are especially common in Charles and St. Marys counties where they were found to comprise approximately forty per cent of the total number of vultures seen. Going north from here, the ratio of Black Vultures to Turkey Vultures (*Cathartes aura*) was found to drop steadily until after passing through the latitude of Laurel, in Prince Georges County, the Black Vultures practically disappear. Elsewhere in central and western Maryland the species is apparently of rare occurrence except along the Potomac River valley, where it occurs regularly at least as far as Williamsport in Washington County. Surprisingly enough, this species was found to be either rare or absent over the greater part of the "Eastern Shore" (Maryland portion of the Del-Mar-Va Peninsula), which in many ways is more southern in its general aspect than any other part of the state. However, there are apparently local populations around Wye Mills in Queen Annes County and around Snow Hill and Pocomoke City, in Worcester County.

A Black Vulture nest containing one egg, found on April 8, 1943, in an abandoned shanty near the Patuxent Research Refuge, Bowie, Maryland, was probably near the northern limit of the breeding range of this species.

GOLDEN EAGLE (*Aquila chrysaëtos canadensis*).—Among recent Maryland records for this species are an adult seen on March 22, 1944, at Glen Burnie by Frances T. Elkins, one observed on October 21, 1945, migrating over Washington Monument State Park near Boonesboro, and an immature at the Patuxent Research Refuge near Bowie on October 26 and 28, 1945.

MARSH HAWK (*Circus cyaneus hudsonius*).—This species nests in the more extensive tidewater marshes of the state and in June, 1946, was observed over wet meadows in Garrett County, where one was recorded at the Cranesville Swamp and another in a swamp near the south end of Deep Creek Lake.

VIRGINIA RAIL (*Rallus limicola limicola*).—This species nests regularly over the tidal (including fresh and salt-water) marshes of the state and in the open glades or wet meadows of the Allegany Plateau in Garrett County.

GOLDEN PLOVER (*Pluvialis dominica*).—An immature male (*P. d. dominica*) was collected on September 20, 1945, on a sandy mud flat on Assateague Island, three miles south of Ocean City. This bird was associated with about thirty Black-bellied Plovers (*Squatarola squatarola*). Since the Golden Plover ordinarily migrates offshore in fall, the presence of this individual on the island might be explained by the strong winds which prevailed in this area during the tropical hurricane of September 17 and 18. On May 1, 1946, another single bird was observed in the same area. One previous specimen of this species was collected on March 28, 1911, at Nanjemoy Creek, Charles County, by John B. Peyton (Cooke, Proc. Biol. Soc. Wash., 42: 32, 1929).

UPLAND PLOVER (*Bartramia longicauda*).—The summer occurrence of this species on the Allegany Plateau was discovered on June 22, 1946, when a single bird was observed perched on a telephone pole near Accident, in Garrett County.

WILLET (*Catoptrophorus semipalmatus*).—In 1945, F. M. Uhler informed us that he found Willets in large numbers and apparently nesting on the salt marshes three miles southeast of Elliott, in Dorchester County. In 1946, a general survey was made of this area and this species was found to nest commonly, although somewhat locally,

throughout the salt marshes of Somerset County and southern Dorchester County. Two birds also were noted on Popes Island, on the Maryland coast, on June 17, 1946, although no evidence of nesting was noted here.

PURPLE SANDPIPER (*Erolia maritima*).—This species was first recorded at Ocean City, Maryland, by the Delaware Valley Ornithological Club on May 12, 1945. Since then, up to fifteen individuals were observed by us during the late fall of 1945 and through the winter and spring of 1946. They were found only on or near the two rocky jetties on either side of the inlet at Ocean City. Our earliest observation was made on November 27, 1945, and specimens were taken on November 30. Our latest was on May 19, 1946, when three individuals were seen.

WHITE-RUMPED SANDPIPER (*Erolia fuscicollis*).—Although this species is undoubtedly of regular occurrence in Maryland during migration, published records are so few that the following observations may be of interest. Four were seen, including one that was collected, on Assateague Island, within three miles of Ocean City on September 19, 1945; one was seen near Licksville, Frederick County, on May 11, 1946; and two were seen at Chesapeake Beach, Calvert County, on June 3, 1946.

BAIRD'S SANDPIPER (*Erolia bairdii*).—One was collected at West Ocean City on September 29, 1945. Previous records include one seen at Scotland Beach, St. Marys County, on August 19, 1928 (Ball, Auk, 47: 94, 1930), and one seen at Deep Creek Lake, Garrett County, on October 18 and 24, 1936 (M. Brooks, Auk, 55: 127, 1938).

WESTERN SANDPIPER (*Ereunetes mauri*).—During the fall shorebird flight of 1945, the first individuals of this species were recorded on the flats three miles south of Ocean City on August 31, when two of these birds were found associated with Semipalmated Sandpipers (*Ereunetes pusillus*). On September 19 and 20, this species had increased somewhat; a total of 20 was recorded, all associated with Semipalmated Sandpipers. At this time it was estimated that the Western Sandpipers comprised about fifteen per cent of the individuals in the mixed flocks of these two species. When the beaches were visited on September 29, a count of 32 Western to 130 Semipalmated Sandpipers was made. A winter record of this species was made on January 20, 1946, when two were collected on the flats three miles south of Ocean City by Mr. R. Bruce Overington who accompanied us.

MARBLED GODWIT (*Limosa fedoa*).—W. H. Fisher (Oologist, 11: 97, 1894) states that the Marbled Godwit has been shot on the marshes along the coast, but no subsequent records are available. A total of four of these birds, all singles, was observed during the period August 20 to 30, 1945, between Ocean City and the flats three miles south of there. One of these was associated with four Hudsonian Curlews (*Numenius phaeopus*).

*PARASITIC JAEGER (*Stercorarius parasiticus*).—On May 11, 1946, while we were on a trip with the Audubon Society of the District of Columbia, a Parasitic Jaeger was observed as it flew a short distance off-shore at Maryland Beach. It was seen on both sides of the Maryland-Delaware state line.

ICELAND GULL (*Larus leucopterus leucopterus*).—This species was first noted in Maryland on November 23, 1893, when F. C. Kirkwood saw an immature bird on the Inner Harbor of Baltimore (Kirkwood, Birds of Maryland, 1895); but no records are at hand for the following fifty years. During the past two winters, an adult bird has been recorded five times by numerous observers along the Chesapeake Ferry route from Sandy Point, Anne Arundel County, to Matapeake, Queen Annes County, on the following dates: February 18 and 25, 1945 (Irving Hampe, Maryland, 15: 77), May 12, 1945, January 18, 1946, and May 12, 1946. (An immature was seen on March 12, 1945, on the Potomac River in the District of Columbia.)

*GULL-BILLED TERN (*Gelochelidon nilotica aranea*).—Between five and ten pairs of Gull-billed Terns were found nesting together with large numbers of Common Terns (*Sterna hirundo hirundo*) and Black Skimmers (*Rynchops nigra nigra*) on a small sandy island in Chincoteague Bay, one mile south-southeast of South Point, Sinepuxent Neck. This island was formed by dredging operations about eight years ago. On June 3, 1945, a nest containing four eggs was found and an adult male was collected; and on July 14, 1946, two young about three-fourths grown were banded. On June 6, 1946, two pairs were found nesting on the outermost of the Clam Harbor Tumps located one-half mile southeast of Mills Island. Here one young about three-fourths grown was banded. These birds were associated with large numbers of Forster's Terns (*Sterna forsteri*) and Black Skimmers.

FORSTER'S TERN (*Sterna forsteri*).—During 1945 and 1946 large colonies were found in Chincoteague Bay on Robins Marsh and on the Clam Harbor Tumps, and small colonies were found on Striking Marsh and on an island one mile south-southeast of South Point. Young on the wing were observed as early as July 3, 1945, although many adults were still incubating eggs at this time. In the spring of 1946, Forster's Terns were first noted in the vicinity of their nesting ground on April 7, well ahead of other terns. Kirkwood (Birds of Maryland, 1895) reported a large nesting colony at North Beach, ten miles below Ocean City, in June, 1894.

LEAST TERN (*Sterna albifrons antillarum*).—Nesting colonies of Least Terns were found all along the coast of Maryland and on sandy stretches along the Chesapeake Bay shores as far north as Kent Narrows in Queen Annes County on the eastern shore of the bay, and Turkey Point in Anne Arundel County on the western shore. On May 7, 1946, adults were seen near Nanjemoy Creek in Charles County.

ROYAL TERN (*Thalasseus maximus*).—In 1945 this species was found commonly along the coast from August 27 to November 3, and two were seen on November 27 near Ocean City. On July 14, 1946, one was observed over Chincoteague Bay near South Point. A specimen was obtained near Ocean City on August 27, 1945.

*CABOT'S TERN (*Thalasseus sandvicensis*).—On September 19, 1945, two were observed resting on an exposed tidal flat at Ocean City. They were associated with a considerable number of Caspian, Royal, and Forster's Terns. These birds were seen the day after the tropical storm of September 17–18.

CASPIAN TERN (*Hydroprogne caspia*).—In 1945, from August 19 to September 29, this species was found fairly commonly along the coast, where it was usually associated with the more numerous Royal Tern. An adult female was collected near Ocean City on September 19, 1945, and two birds were seen on Chesapeake Bay near Sandy Point, Anne Arundel County, on August 19, 1945. During the spring of 1946, one bird was seen at Cobb Island, Charles County, on April 13; thirteen birds at South Marsh Island and Deale Island, Somerset County, on April 27 and 28; and one at Nanjemoy Creek, Charles County, on May 7. On April 18, 1943, one was reported by Frances T. Elkins at Marley Creek, Anne Arundel County. One adult was seen near the coast at Pope's Island, Worcester County, on June 17, 1946.

SAW-WHET OWL (*Cryptoglaux acadica*).—One was heard during the evening of July 5, 1945, and seen the following morning in a swamp three miles south of Finzel, Garrett County. Another was heard in the early morning of July 7, 1945, in the Maryland portion of Cranesville Swamp in the same county. Previous summer records include a full-grown young bird captured in Cumberland on July 6, 1903 (G. Eifrig, Auk, 21: 240, 1904). The Saw-whet Owl has been recorded three times on the Patuxent Research Refuge, Bowie, during the colder months: two birds were caught in Verbail hawk and owl traps on March 30, 1944, and November 9, 1944, and one was seen on October 15, 1944.

CHUCK-WILL'S-WIDOW (*Caprimulgus carolinensis*).—During the summers of 1945 and 1946, this species was found to occur regularly in St. Marys County as far north as Leonardtown and along the west shore of Chesapeake Bay as far north as Holland Point in Anne Arundel County. Along the eastern shore of Chesapeake Bay it was recorded as far north as Nanticoke in Wicomico County. On the coast it occurs commonly all the way to the Delaware line. In the interior between Chesapeake Bay and the ocean, it was recorded in the vicinity of Pittsville in Wicomico County, and around Pocomoke City in Worcester County.

ALDER FLYCATCHER (*Empidonax traillii traillii*).—On June 21 and 22, 1946, this species was found in the Cherry Run Swamps about three miles east of McHenry, in Garrett County, and also in a swamp along Miller's Run about four miles north of Oakland, also in Garrett County. A previous midsummer record was made in 1918, when G. Eifrig saw one at Thayerville (Auk, 37: 555, 1920). One singing the "fitz-bew" song characteristic of mid-western birds, was collected at Patuxent Research Refuge on June 2, 1943, and on May 26, 1946, one giving the same song was heard at Lake Roland, Baltimore County, by Allen W. Stokes.

HORNED LARK (*Otocoris alpestris*).—The Prairie Horned Lark (*O. a. praticola*) now occurs as a nesting bird over practically the entire state from the ocean front to the Allegany Plateau, inclusive. It is more sparingly distributed in "Southern Maryland" (western shore Coastal Plain) than elsewhere, being somewhat local here, especially in the southern part. The Northern Horned Lark (*O. a. alpestris*) occurs regularly and commonly as a winter resident along the ocean beach and on the Allegany Plateau in Garrett County.

TREE SWALLOW (*Iridoprocne bicolor*).—This species, which occurs regularly as a summer resident in tidewater Maryland, was recorded on July 7, 1945, at Cranesville Swamp on the Allegany Plateau of Garrett County by James B. Cope. It was previously found nesting at Crellin, in this county, on June 29, 1920, by G. Eifrig (Auk, 37: 599, 1920). It is not known to breed in the area between the Allegany Plateau and the western shore of Chesapeake Bay.

NORTHERN RAVEN (*Corvus corax principalis*).—Two were seen at Conneway Hill (3200 feet) in Garrett County on July 7, 1945. The only other recent record for Maryland was a specimen taken on November 8, 1929, at Sunnybrook, in Baltimore County (Kirkwood, Auk, 47: 255, 1930).

WHITE-BREASTED NUTHATCH (*Sitta carolinensis carolinensis*).—This species, which occurs regularly as a summer resident on the Piedmont and in the mountains of western Maryland, was also found commonly in the cypress swamps along the Pocomoke River in Worcester County. Elsewhere on the coastal plain, it is quite rare.

SHORT-BILLED MARSH WREN (*Cistothorus platensis stellaris*).—This species occurs regularly as a summer resident in the tide-water marshes along the coast and on the eastern shore of Chesapeake Bay as far north as Kent Narrows, in Queen Annes County. Along the coast it is rather rare and local but on the Chesapeake eastern-shore marshes and especially in Dorchester and Somerset counties it is quite common. It was also found in summer on the west shore of Chesapeake Bay at Franklin Point, in Anne Arundel County. A previous summer record for the western shore was made on June 25, 1935, when A. Wetmore found a nest with seven eggs at Point Lookout, St. Marys County (Auk, 52: 455, 1935). On June 28, 1946, at least two singing males were found in a large wet meadow in the Thayerville Swamp, about eight miles north of Oakland, in Garrett County.

HERMIT THRUSH (*Hylocichla guttata*).—On July 8, 1945, two were heard singing at the edge of the Cherry Creek swamp about two miles east of McHenry, in Garrett County. On June 20, 1946, two singing males were recorded near the Piney Creek

swamps about three miles west of Finzel, in the same county. Previous summer records have been made in Garrett County at Finzel, Grantsville, Bittinger, Mountain Lake Park, and Accident, by E. A. Preble (Md. Geol. Surv., 1900: 306) and G. Eifrig (Auk, 55: 281, 1938).

GOLDEN-CROWNED KINGLET (*Regulus satrapa*).—Two males in full song and one female were seen near the center of Wolf Swamp (2600 feet), three and one-half miles northeast of New Germany, on July 6, 1945. Herman Behr (Auk, 31: 548, 1914) states that this species was formerly a regular breeder in localities thickly sprinkled with spruce timber, but after the spruce was cut the kinglet did not remain to breed.

PROTHONOTARY WARBLER (*Protonotaria citrea*).—This species is now distributed as a fairly common bird along swampy river and stream bottoms over the entire coastal plain. It is especially abundant along the Pocomoke River where it is the most common species present. It also ranges up the Potomac River valley within the Piedmont as far as Seneca Creek.

SWAINSON'S WARBLER (*Limnothlypis swainsonii*).—This species was first recorded in Maryland by Joseph M. Cadbury, who found one in the Pocomoke swamp near Willards on May 9 and 10, 1942. On May 2, 1946, two pairs of Swainson's Warblers were seen and one adult male was collected in a swamp along the Pocomoke River about five miles southwest of Pocomoke City, in Worcester County. During repeated trips to the area during the summer, this species was always found, and it is interesting to note that another male apparently took the place of the one that was collected, since it was found singing in exactly the same spot.

BLUE-WINGED WARBLER (*Vermivora pinus*).—During June of 1946 this species was found in fair numbers in Cecil County within five miles of the Susquehanna River between Rowlandsville and the Pennsylvania line. It was also found in the Blue Ridge Mountains between Smithsburg and Sabillasville. Previous summer records indicate that it occurred somewhat sparingly in the vicinity of Baltimore at one time.

*ALASKA YELLOW WARBLER (*Dendroica petechia rubiginosa*).—On September 20, 1945, one was collected in a thicket on Assateague Island about four miles south of Ocean City. The identification of this specimen was made by Dr. John W. Aldrich.

BLACK-THROATED GREEN WARBLER (*Dendroica virens virens*).—This species, which occurs commonly as a summer resident on the Allegany Plateau of Garrett County and western Allegany County, was also found on June 8, 1946, in the Blue Ridge Mountains in two dense hemlock stands. These stands were in Frederick County, one near Thurmont (800 feet) and the other five miles northwest of Lewistown (1400 feet).

CERULEAN WARBLER (*Dendroica cerulea*).—During June, 1946, this species was found to occur commonly on the flood plain of the Susquehanna River, in Cecil County, and somewhat sparingly along the Savage River in Garrett County. Previous summer records indicate that it occurs locally north of Baltimore in the vicinity of Towson and Cockeysville, and on the central Appalachian ridges of Allegany County (Haven Kolb, Auk, 60: 275, 1943).

YELLOW-THROATED WARBLER (*Dendroica dominica dominica*).—The breeding range of this species in Maryland is apparently largely coextensive with the distribution of loblolly pine (*Pinus taeda*). On the "Eastern Shore" it occurs regularly in pine stands as far north as Kent Narrows, although along the Pocomoke River it also occurs commonly in cypress swamps. On the western-shore coastal plain, it is found commonly in southern St. Marys County and occurs locally along Chesapeake Bay as far north as Sandy Point, in Anne Arundel County, and up the Potomac River as far as Indian Head, in Charles County. It is rare or irregular north of this region.

CHESTNUT-SIDED WARBLER (*Dendroica pensylvanica*).—The breeding range of this species is restricted to the mountains of western Maryland, extending eastward as far as the Blue Ridge Mountains in Frederick County. In the latter mountains it occurs north of Myersville, being locally common above 1300 feet and occasionally down to 800 feet. The nesting of one pair near Baltimore was reported by M. Brooke Meanley, Jr. (Auk, 55: 542, 1938).

NORTHERN WATER-THRUSH (*Seiurus noveboracensis noveboracensis*).—During the summers of 1945 and 1946, this species was found to occur regularly in the swamps and in many of the hemlock and rhododendron tangles along streams throughout most of the Allegany Plateau in Garrett County. The summer occurrence of this species at four localities in this county has been previously noted by E. A. Preble (Md. Geol. Surv., 1900), G. Eifrig (Auk, 37: 554, 1920; and Wilson Bull., 45: 61, 1933), and M. Brooks (Wilson Bull., 52: 263, 1940).

MOURNING WARBLER (*Oporornis philadelphia*).—During 1946 this species was found to occur locally as a fairly common summer resident above 3000 feet on Backbone Mountain in Garrett County, from Swanton south to Roth Rock. The Mourning Warbler was previously recorded in western Maryland in summer by Maurice Brooks (Wilson Bull., 52: 263, 1940), who first noted that the line of distribution followed the 3000-foot contour mark with surprising accuracy.

HOODED WARBLER (*Wilsonia citrina*).—The Hooded Warbler is a common nesting species throughout most of the western-shore coastal plain. It also occurs on the Piedmont and in the mountains (including the Allegany Plateau) of western Maryland, where it is somewhat more local and sparingly distributed. It was not found on the "Eastern Shore" coastal plain except along the Pocomoke River and its tributaries, where it occurs quite commonly.

BOBOLINK (*Dolichonyx oryzivorus*).—During the summers of 1945 and 1946, this species was found scattered in hay fields above 2500 feet throughout that part of Garrett County lying west of Backbone and Big Savage mountains. The summer occurrence of this species near Accident, Grantsville, Bear Creek, and Frostburg was previously reported by E. A. Preble (Md. Geol. Surv., 1900) and G. Eifrig (Auk, 21: 242, 1904, and 37: 555, 1920; and Wilson Bull.. 45: 63, 1933).

BOAT-TAILED GRACKLE (*Cassidix mexicanus major*).—During 1945 and 1946, this species occurred fairly commonly along the coast all the way to the Delaware line. Along the eastern shore of Chesapeake Bay, it was found regularly along the salt marshes as far north as Deale Island in Somerset County. It apparently also occurs north of here irregularly, as there are a few previous records of its occurrence beyond this point. On July 5, 1946, two males, one carrying food, were seen near Sandy Point in Anne Arundel County.

BLUE GROSBEAK (*Pheucticus caeruleus*).—Blue Grosbeaks are fairly common summer residents in Queen Annes and Talbot counties, but apparently are either very rare or absent over the remainder of the eastern-shore coastal plain. On the western-shore coastal plain they seem to be somewhat sparingly distributed as scattered pairs throughout. Blue Grosbeaks are rare elsewhere in Maryland.

DICKCISSEL (*Spiza americana*).—A singing male was found three miles south of West Friendship in Howard County on June 19, 1946. This species has been reported in recent years as breeding near Dickerson in Montgomery County (A. Wetmore and F. C. Lincoln, Auk, 45: 508, 1928).

EVENING GROSBEAK (*Hesperiphona vespertina*).—During the remarkable invasion of this species last winter (1945–1946), it was reported from the following counties: Baltimore, Charles, Garrett, Montgomery, Prince Georges, and Washington. The first flock was recorded in Baltimore on November 15 by John T. Emlen and David

E. Davis (Md. Birdlife, 1: 24, 1946); some remained at least until May 11, when a flock of seven was seen at Cedar Mill Grove, Washington County.

PURPLE FINCH (*Carpodacus purpureus*).—During the summer of 1946, this species was recorded in Garrett County at the Cherry Creek swamps three miles east of McHenry, and in the Maryland part of Cranesville swamp. The actions of these birds indicated that they were nesting. There is a previous summer record from Accident, where G. Eifrig took a singing male on July 27, 1903 (Auk, 21: 240, 1904).

SAVANNAH SPARROW (*Passerculus sandwichensis*).—During the summers of 1945 and 1946, this species was found to occur locally throughout that part of the Allegany Plateau in Garrett County lying west of Backbone and Big Savage mountains. Previous occurrences of this species in Garrett County during the summer have been reported from Mountain Lake Park, Accident, and Oakland by G. Eifrig (Auk, 26: 438, 1909; 37: 599, 1921; 55: 282, 1938) and T. D. Burleigh (Auk, 49: 97, 1942). The Savannah Sparrow is a fairly common winter resident along the coast of Maryland.

*On January 20, 1946, a specimen of the Labrador Savannah Sparrow (*P. s. labradorius*) was collected north of Ocean City. Another was taken on May 7, 1946, at the Patuxent Research Refuge near Bowie. Both specimens were identified by Dr. J. W. Aldrich.

HENSLOW'S SPARROW (*Passerherbulus henslowii*).—This species is a common nesting bird in abandoned fields throughout the coastal plain of Maryland, and also occurs sparingly on the Piedmont. In 1945 and 1946, three nesting colonies were also found on the Allegany Plateau, in Garrett County, near Finzel, McHenry, and High Rock on Big Savage Mountain.

SHARP-TAILED SPARROW (*Ammospiza caudacuta*).—Observations made in 1945 and 1946 show that this species nests in the salt marshes all along the coast, and also in salt and brackish marshes along Chesapeake Bay. On the eastern shore of the bay it occurs regularly as far north as Kent Narrows in Queen Annes County, while on the western shore it is of regular occurrence as far up as Sandy Point in Anne Arundel County. Breeding specimens taken at Kent Narrows proved to be *A. c. diversa*.

SEASIDE SPARROW (*Ammospiza maritima*).—The breeding range of this species in Maryland is practically identical with that of the Sharp-tailed Sparrow except that it has not been found north of Idlewilde, in Anne Arundel County, on the western shore of Chesapeake Bay. Breeding specimens taken at Kent Narrows proved to be typical *A. m. maritima*.

VESPER SPARROW (*Pooecetes gramineus*).—During the nesting season this species is found over the entire state, although it is somewhat local and sparingly distributed over much of the Coastal Plain.

CHIPPING SPARROW (*Spizella passerina*).—During the winter of 1945–1946, two flocks of Chipping Sparrows containing a total of fourteen individuals were found in the vicinity of Newark and Snow Hill in Worcester County.

*GAMBEL'S SPARROW (*Zonotrichia leucophrys gambelii*).—An adult female was collected at the Patuxent Research Refuge, near Bowie, on November 8, 1944.

SWAMP SPARROW (*Melospiza georgiana*).—During 1945 and 1946, Swamp Sparrows were found to nest commonly in shrub swamps throughout Garrett County west of Backbone and Big Savage mountains. It was previously recorded near Accident, Oakland, and Negro Mountain, by G. Eifrig (Auk, 37: 600, 1921; 55: 281, 1938).

U. S. Fish and Wildlife Service
Patuxent Research Refuge
Bowie, Maryland

BIRDS OF THE MACMILLAN LABRADOR EXPEDITION, 1946

BY ROBERT GRAYCE

WITH the sunny days of peace returned and oceanic waters free again for unrestricted navigation, it was good news to hear that MacMillan planned once more to steer his famous old ship, the 'Bowdoin,' into polar seas. The ultimate destination of this expedition was to be Frobisher Bay, Baffin Island, to concentrate particularly on the gulls, but ice conditions in the Labrador fjords prevented passage northward beyond Saeglek Bay at 58° 30′ north latitude. Officially the voyage began and ended at Boothbay, Maine (June 29–August 2), cruising a distance of 3,270 miles. Days were consumed awaiting repairs at Sydney, Nova Scotia, and visiting bird islands along the northern shore of the Gulf of St. Lawrence. I have chosen to confine the results of the investigations to the Newfoundland-Labrador area, a classic entity ornithologically studied for seventeen days (July 7–July 23). During this period, activities included a shipboard survey day by day of species seen and their abundance; visits for photography to the 'alcid' islands of Hamilton Inlet, and the Glaucous Gull colonies of Davis Inlet and an island off Port Manvers Run; bird walks for collecting and observations in the coastal coniferous stands or barren tundra of Battle Harbor, Antille Cove, Windy Tickle, Hopedale, Nain, Hebron, McDonald Bay and Saeglek Bay. Fifty-four forms may be reported including four birds new to Austin's Labrador list (Ringed Plover, *Charadrius h. hiaticula;* Kumlien's Gull, *Larus lencopterus kumlieni;* Caspian Tern, *Hydroprogne caspia;* and Mandt's Guillemot, *Cepphus grylle mandtii*) plus the recently subspecifically separated Black-backed Robin, *Turdus migratorius nigrideus* and Newfoundland Yellow Warbler, *Dendroica petechia amnicola.*

The following annotated list has been made brief because of the extensive treatment, including records for the Kumlien's Gull, of the Bowdoin-MacMillan Expedition of 1934, written by Dr. Alfred O. Gross (Auk, 54: 12–42, 1937) which is particularly valuable for the birds of northern Ungava and the Button Islands, not visited by the 1946 expedition. Evarts Loomis has published data on a few species from the southeastern corner of this region which was helpful (Auk, 62: 234–241, 1945). Although the birds were our major object of study, Labrador geographically is a region that stirs the imagination. The presence of an Arctic current strewn with imposing icebergs, the coniferous pockets along a tundra coast, the 'tickles' or inland channels connecting deep fjords, the imposing

mountains of the north carved by an ice sheet, the alcid and white-winged gull colonies, the native peoples, settlements, and alpine plants are subsidiary elements to enliven the ornithological picture often contributing their sociological or ecological impact. Add to this the pleasure of an ocean voyage with interesting companions by one not inclined to seasickness and you have the ingredients of a first-class birding adventure.

For the opportunity of making the voyage, I thank the president and directors of the Massachusetts Audubon Society, now enjoying its fiftieth anniversary, and particularly its secretary, Mr. C. Russell Mason, under whose guidance the Society has also become an active institute of field ornithology. In many ways I am indebted to Dr. Alfred M. Bailey, Director of the Colorado Museum of Natural History, my birding companion through both stormy seas and fair weather. For their stimulation in a region noted for its paucity of variety though abundance of certain individuals, my appreciation is extended to Commander Donald B. MacMillan, his two mates, former Lieutenant John Matthews and former Lieutenant Commander Norman Hanson, and my shipboard friends who were eager to point out any winged form even though it frequently proved to be Black Guillemot 2,897! The trip was made doubly enjoyable by the charming hospitality of the two feminine crew members, Mrs. MacMillan and Miss Helga Knudson, formerly of Greenland.

ANNOTATED LIST OF LABRADOR BIRDS

COMMON LOON, *Gavia immer immer*.—Nine were observed, all on the same day (July 12), at Port Manvers Run, north of Nain.

RED-THROATED LOON, *Gavia stellata*.—The commoner of the Labrador loons, seen from the Straits of Belle Isle to Hebron. Forty-one birds recorded.

SOOTY SHEARWATER, *Puffinus griseus*.—Nine of these hagdons occurred in a small group off Battle Harbor in southern Labrador (July 21).

GREATER SHEARWATER, *Puffinus gravis*.—Two skimmed along by themselves north of Battle Harbor (July 21).

FULMAR, *Fulmarus glacialis glacialis*.—One of these cold-loving species in the dark phase appeared at Saeglek Bay (July 13).

GANNET, *Moris bassana*.—An adult bird flying ten miles south of Domino Run (July 21) was our farthest northern record in Labrador. Thirty-two birds were observed from here to Belle Isle (July 21, 22).

CANADA GOOSE, *Branta canadensis*.—One was seen flying across Straits of Belle Isle (July 7).

BARROW'S GOLDEN-EYE, *Glaucionetta islandica*.—Eight drakes were observed at McDonald Bay, Mugford Tickle. In this cold, barren spot surrounded by mountainous cliffs these male birds paddled without any females about, probably having headed coastwise while the females were brooding.

AMERICAN EIDER, *Somateria mollissima dresseri*;

NORTHERN EIDER, *Somateria mollissima borealis*.—The commonest Labrador pelagic

ducks breeding on the numerous islands all the way north to Saeglek Bay. Males predominated among the birds observed, as was to be expected during the nesting season, outnumbering the females (unmated or with nests broken up) about ten to one according to counts of over four hundred birds in Nain "Tickle" (July 16). Dr. Gross places Hopedale, at the 55° parallel of north latitude, as a probable dividing line for the breeding ranges of the two subspecies.

WHITE-WINGED SCOTER, *Melanitta fusca deglandi*.—The breeding range of this bird is officially given as west of Hudson Bay, yet I saw 173 individuals, with a preponderance of males, scattered from Cape Harrison through the inland channels to Port Manvers Run. Cleveland Bent told me he believed this bird unquestionably will be found nesting in Ungava. MacMillan states that in August this scoter is most abundant.

AMERICAN SCOTER, *Oidemia nigra americana*.—The officially breeding scoter of Labrador produced only 189 individuals. The center of abundance occurred in the region about Nain. They nest in the interior, not on the islands of the channels. None of the three scoters was seen south of the 55° parallel, north latitude.

SURF SCOTER, *Melanitta perspicillata*.—Eighteen birds were listed from Davis Inlet to the vicinity of Nain (July 11, 16), the least abundant of the three scoters at this season.

RED-BREASTED MERGANSER, *Mergus serrator*.—Unusual is the fact that only one bird was seen, a female, far north in the austere setting of Port Manvers Run (July 12).

AMERICAN ROUGH-LEGGED HAWK, *Buteo lagopus s.johannis*.—Scarce this year after their cyclic journey southward coincident with the failure of the lemming supply, two of these hawks in the normal phase were spied by MacMillan circling high over the steep escarpments of Mugford Tickle (July 13). The pair that nests on the ledges at Nain did not appear this season.

GYRFALCON, *Falco rusticolus obsoletus*.—Marvelous to watch were the swift flights and breathtaking stoops of this largest of the falcons, the lord of the desert tundra of northern Labrador. Only one was seen, and this in intermediate plumage, far north on the shores of Saeglet Bay (July 13).

DUCK HAWK, *Falco peregrinus anatum*.—A pair nested on one of the little offshore islands outside Nain (July 16).

WILLOW PTARMIGAN, *Lagopus lagopus albus*.—For long hours over the barrens, Dr. Bailey and I searched for these birds unavailingly. From information garnered at Nain, one could say they were low but not at the bottom of their cycle. Roland Clement, encamped the year before at Northwest River, found them abundant there at that time. One probable record was made (observed from ship) near Antille Cove (July 22).

EUROPEAN RINGED PLOVER, *Charadrius hiaticula hiaticula*.—Bray reported these birds in eastern Baffin Island as the common form. Taverner mentions the lesser webbing of the foot as the only mark distinguishing this species from the Semipalmated Plover. The larger size, thicker breast band and restricted white line over the bill shown by a bird observed on the wet tundra at McDonald Bay (July 12) places on the hypothetical list a new stray for Newfoundland Labrador. A comparison of specimens at the Museum of Comparative Zoölogy verifies this sight record.

SEMIPALMATED PLOVER, *Charadrius hiaticula semipalmatus*.—One pair and another individual at Nain (July 16) on a shingly beach where the species nests yearly.

SPOTTED SANDPIPER, *Actitis macularia*.—Though usually found along the little brooks formed from the melted snowfields, during an early migration I saw ten birds

on the small area of Battle Harbor Island (July 22). A far northern record was made by one bird at Saeglek Bay (July 13).

RED PHALAROPE, *Phalaropus fulicarius*.—The brilliantly brick-colored females with white facial patch had come seaward to play about in the Labrador ice fields during the summer. Eleven were observed (July 14) among the floes out from Saeglek Bay.

NORTHERN PHALAROPE, *Lobipes lobatus*.—Accredited as the more southerly breeding species, yet only one bird was seen amongst the flock of Red Phalaropes.

PARASITIC JAEGER, *Stercorarius parasiticus*.—One of these rapacious sea hawks in the dark phase observed in the Strait of Belle Isle (July 7) can be recorded for this region, although there are several records of this species and the Pomarine Jaeger during the expedition off Nova Scotia and Quebec-Labrador.

GLAUCOUS GULL, *Larus hyperboreus hyperboreus*.—These great white birds flying across the sky personify the spirit of the Arctic oceanic regions. None appeared south of the 55th parallel at the Hopedale area. The most southerly nesting station visited was Gull Cliff, on Freestone Island, oceanward from Davis Inlet, where approximately twenty birds bred. As our ship progressed, the Burgomasters became immediately the common gull seen every day from this point, with their center of abundance at Port Manvers Run and islands offshore. The smaller but similar Iceland Gull (*Larus leucopterus leucopterus*) was searched for in vain.

KUMLIEN'S GULL, *Larus leucopterus kumlieni*.—To study this bird on its nesting ground in eastern Baffin Island was to have been the prime scientific purpose of the expedition. An immature bird (the size of a Herring Gull but lighter, with paler brownish-gray primaries and more reddish legs and feet) which flew about our ship and perched on an iceberg out from Saeglek Bay (July 14) can be recorded as this form.

GREAT BLACK-BACKED GULL, *Larus marinus*.—A nesting species on the islands of the Labrador region, the Minister Gull is never numerous. At Port Manvers Run MacMillan noticed them breeding on a site previously utilized by Glaucous Gulls, thus demonstrating their more dominating disposition, though on an offshore island holding close to fifty nesting pair of Glaucous Gulls there were eight Black-backed Gulls (no Herring Gulls).

HERRING GULL, *Larus argentatus smithsonianus*.—Austin categorizes this coastal breeding bird as Labrador's commonest gull. According to our observations a division of Labrador into north and south sections at 55° north latitude would limit Austin's statement as correct with regard to the south section only. Their absence as scavengers at the harbors and settlements (one of the surprising bits of local gull behavior) calls to mind their persecution by six generations of fisherfolk for bait and by native peoples for food.

ATLANTIC KITTIWAKE, *Rissa tridactyla tridactyla*.—More than three hundred of these white dove-like gulls, wings tipped with inky black, circled over the first huge iceberg encountered outside the Straits of Belle Isle (July 7). Five birds south of Domino Island (July 21) completed our Labrador record. No nesting sites were found.

ARCTIC TERN, *Sterna paradisaea*.—Twelve birds were flying outside Antille Cove (July 7). On our passage by the islands of Nanuhtok and Turnavik Bays, where Austin once banded these terns, not one bird was seen.

CASPIAN TERN, *Hydroprogne caspia*.—Leaving Antille Cove (July 7), Dr. Bailey noted a tern in the distance decidedly larger than the others which he believed to be of this species, with which judgment I concur.

RAZOR-BILLED AUK, *Alca torda torda*.—Breeding in rock crevices and talus slopes on the outside islands only, these auks spread from Hamilton Inlet (where they were surpassed in numbers only by the Atlantic Puffin) to the Nain region. The white 'hip pockets' of this species in flight differentiate it afar from the puffin and murres. In speed of flight they quickly outdistance the sluggish puffin.

COMMON MURRE, *Uria aalge aalge*.—Murres are uncommon birds, having suffered most at the ignorant hands of the egger. At their center of abundance in the Gannet Clusters I averaged, during a brief visit to the chief island, not more than fifty nesting pairs; only two of those I observed were of the ringed variety.

BRÜNNICH'S MURRE, *Uria lomvia lomvia*.—A few birds rested on the waters of the Gannet Clusters on which islands they unquestionably nested.

NORTHERN BLACK GUILLEMOT, *Cepphus grylle arcticus*.—The most successful member of the family in Labrador was always numerous, especially in the channels.

MANDT'S GUILLEMOT, *Cepphus grylle mandti*.—After guillemots were seen by the thousands, the enlarged white area of the wing was conspicuous, giving the bird an even more twinkling appearance in flight. In the ice floes out from Saeglek Bay (July 12) two birds close by were positively identified.

ATLANTIC PUFFIN, *Fratercula arctica arctica*.—Extremely abundant (at least two thousand bred on the Gannet Clusters), these birds were at home about the islands, in open water and in the ice-ridden floes, but never appeared in the inland channels. the particular niche of the guillemots.

SNOWY OWL, *Nyctea scandiaca*.—There is some doubt if most of these cyclic visitors southward, so abundant last winter (1945–1946), ever attempt to return to the Arctic to breed. It is a moot question whether sight records from Labrador the following season prove very much. One bird disturbed by me flew to another islet of the Gannet Clusters (July 9). At Hopedale (July 10) hearing this owl's call was a novel experience. Neither of these could have been breeding birds so far south, but might have wintered in the vicinity. At Nain we were told they were "very abundant" last winter, though there was no evidence of their presence during our visit. Everyone presumed they had gone back north, as they probably had done.

EASTERN BELTED KINGFISHER, *Megaceryle alcyon alcyon*.—A lone kingfisher called and flew over the harbor at St. Mary's (July 21).

NORTHERN HORNED LARK, *Otocoris alpestris alpestris*.—This exotic-faced terrestrial bird, the companion of the American Pipit, is confined to the open stretches of the coastal barrens. Over one hundred individuals were counted on Battle Harbor Island (July 22), slightly predominating here over the pipit.

LABRADOR JAY, *Persioreus canadensis nigricapillus*.—Uncommon during the summer in the coastwise coniferous pockets and at the settlements, six were collected at Nain by Dr. Bailey (July 12).

NORTHERN RAVEN, *Corvus corax principalis*.—Either flying among the stark, hoary cliffs of the northern mountains, somber tenants of the glacial cirques, or lying in wait for hapless fledglings or exposed eggs on the offshore islands, ravens appear the length of the region—the 'crow' of the Labrador where there are no crows. Eleven birds were recorded.

BLACK-BACKED ROBIN, *Turdus migratorius nigrideus*.—The new, large subspecies of intensified coloration, with the black of the head extending uninterruptedly into the back, is the robin of the coastal spruce-fir-larch pockets that extend north to Napartok Bay south of Hebron. I observed them in small numbers from Antille Cove (July 7) as far north as Nain (July 11).

GRAY-CHEEKED THRUSH, *Hylocichla minima minima*.—Nine Gray-cheeked Thrushes came out at dusk about the Grenville Hospital at St. Mary's (July 21), even perching on a clothesline to give their rapturous evening serenade. The song, even heard this late in the season, was inseparable to me from the notes of Bicknell's Thrush. One bird was seen at Nain (July 16).

AMERICAN PIPIT, *Anthus spinoletta rubescens*.—Inhabitants of the desert tundra, spurning close proximity to man. Two hours' walk one evening ashore at Saeglek Bay (July 13) produced over ten pipits sharing their habitat with the horned larks, but now the predominating species. Four birds were observed in the Gannet Clusters (July 9).

NORTHERN YELLOW WARBLER, *Dendroica petechia amnicola*.—One bird, most likely of this subspecies, responded to my squeaking and popped up through the foliage skirting a larch grove at St. Mary's (July 21).

MYRTLE WARBLER, *Dendroica coronata coronata*.—Dr. Bailey collected one at Nain (July 12).

BLACKPOLL WARBLER, *Dendroica striata*.—This is the common Labrador warbler heard in every coniferous band.

COMMON REDPOLL, *Acanthis flammea flammea*.—The only redpoll observed and most abundant. I found a nest with four young about three days old, covered with black natal down, at Nain (July 15). During my first landfall at Antille Cove (July 7), the evening flight performance of this red and gray sparrow proved a special treat. High in the air, cavorting in dexterous evolutions and arching volplanes over a valley embracing an eighth of a mile territory, these tiny fringillids darted, calling their melodious *che-e-e-ur* and non-metallic rattle and always returning to a favorite perch.

LABRADOR SAVANNAH SPARROW, *Passerculus sandwichensis labradorius*.—Only at Hebron (July 13) were savannah sparrows found, but here they proved most common. Fourteen birds flitted beyond the Moravian missionary enclosure and in the scrubby acres behind the village.

SLATE-COLORED JUNCO, *Junco hyemalis hyemalis*.—More common in the Canadian-Hudsonian Zone of the south. One bird was observed at Nain (July 21).

WHITE-CROWNED SPARROW, *Zonotrichia leucophrys leucophrys*.—Horned larks, pipits and White-crowned Sparrows vied for the honor of being the commonest oscinine bird along the Labrador coast. I give the palm to this species, abundant in every spruce pocket, coastal village and sparsely vegetated glade. At least its plaintive, sweet notes must be ranked as Labrador's characteristic bird song. One bird was singing in the inhospitable tundra at Saeglek Bay (July 13). By a combination of observation and collecting the specimen, Dr. Bailey found that the male bird fed the three birds of the year after nest desertion when the family group was still intact.

WHITE-THROATED SPARROW, *Zonotrichia albicollis*.—One individual was heard at St. Mary's (July 21).

LINCOLN'S SPARROW, *Melospiza lincolnii lincolnii*.—Four of these Sparrows lived in the willow tangles of a brook at St. Mary's Harbor (July 21).

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NOTES ON SOME GREENLAND BIRDS

BY A. L. RAND

THE avifauna of Greenland is wonderfully well documented, compared with the other Arctic islands in the Western Hemisphere, and in addition to such summaries as that of Schiöler in 1926, and Oldendow's 1933 paper, and such recent reports on various areas as those published in the 'Ibis' and in 'Meddelelser om Grønland' and elsewhere, Salomonsen in 1935, and Hørring and Salomonsen in 1941 have summarized the records of many species of rare or unusual occurrence in Greenland, with many new records.

The National Museum of Canada has accumulated a number of Greenland bird specimens from various sources, some of them representing records worthy of note. In presenting them it is advisable to summarize briefly the origin of the Greenland collections in the National Museum. The following are the sources from which the Greenland material has been received:

Previous to 1914, about six skins of four species were purchased from Ward's Natural History Establishment, Rochester, New York. They were collected in 1909 and 1910, but no collector is given. The localities represented are: Sarfaugnak, Godthaab, and Nanortalik.

In 1923, J. Dewey Soper for the National Museum of Canada accompanied the C.G.S. 'Arctic' on its annual cruise, during which stops were made in Greenland at Godhavn, July 30, Melville Bay, August 4, Smith Sound, August 7, and Etah, August 8, and about 40 bird skins of eleven species were collected.

In 1928, Dr. R. M. Anderson of the National Museum of Canada accompanied the Canadian Eastern Arctic Patrol, and about 69 specimens of three species were collected at Hakluyt Island, Smith Sound, on August 7.

In 1929, Mr. P. A. Taverner of the National Museum of Canada accompanied the Canadian Eastern Arctic Patrol on the S.S. 'Beothic' and collected about 15 specimens representing five species at Etah, August 4, Robertson Bay, August 4, and Smith Sound, August 7.

In 1941, A. E. Porsild of the National Museum of Canada, on loan to the Canadian Department of External Affairs as Canadian Consul of Greenland, brought together a series of bird skins by personal collection and by purchase from the collections of the Seminary Museum at Godthaab (the latter mostly collected in the period 1925–1935), and again, in 1944, sent to the Museum a collection he made in 1942 and 1943. These collections totalled about 74 skins and represented about 37 species. The localities represented are:

Ameralik Fjord	Kangek, Godthaab
Angmagssalik	Kronprinsens Island (= Disco Bay)
Disco Bay	Nanortalik
Godhavn	Napossok
Godthaab	Nordlandet (= Godthaab Fjord)
Godthaab Fjord	Nunarssuak, Julianehaab Distr.
Holsteinsborg	Prøven
Julianehaab	Sukkertoppen
Kagssimiut	Tuapait, Nanortalik

In 1944, Dr. M. J. Dunbar, Canadian Consul to Greenland, secured about a half dozen skins representing five species and sent them to the National Museum from Godthaab in 1945.

The total Greenland collections in the National Museum thus consist of about 210 skins, representing about 48 species.

A considerable number of the species represented are of regular occurrence in Greenland and need no comment. Some others, received through the Greenland Seminary Museum at Godthaab, though they represent important records, have already been included in Oldendow's or in Hørring and Salomonsen's papers. The following specimens are worthy of special comment.

COMMON LOON, *Gavia immer* (Brünnich).—Nordlandet, Godthaab: 2 ♂ ad., May 31, 1943, June 10, 1926; from A. E. Porsild.

Wing (chord): 337, 355 mm.

Exposed culmen: 72, 76 mm.

Greenland is usually included in the range of *G. i. immer* (Brünnich) characterized by its larger size. However the present specimens are about as small as North Dakota specimens of the species that are usually referred to as *G. i. elasson* Bishop. Elsewhere (Canadian Field-Naturalist, *in press*) I am discussing geographical variation in this species in regard to the two clines, with different directional trends, represented by wing length and bill length, and the difficulty of recognizing any populations by subspecific names.

EUROPEAN GREEN-WINGED TEAL, *Anas crecca crecca* Linnaeus.—near Godthaab; 1 ♂ ad., 1 ♂ imm.; no date; from A. E. Porsild.

Wing (chord): ♂ ad., 179; ♂ imm., 178 mm.

Exposed culmen: ♂ ad., 35; ♂ imm., 36 mm.

These seem to be in addition to the many records summarized by Hørring and Salomonsen, 1941, pp. 5–7.

The adult male specimen is a fragmentary skin, with the head markings of this race. The immature male, with a few adult feathers coming in on the back, has the distal half of the light bar above the speculum white, the basal half brownish. While the character of this stripe being brownish for its entire length in *A. c. carolinensis* Gmelin appears to be fairly reliable, it is not infallible. Phillips, p. 232, has pointed out that it is probable that at least nine out of every ten specimens can be correctly placed by this character alone.

RED-BREASTED MERGANSER, *Mergus serrator* Linnaeus.—Godthaab; 2 ♂ ad., 1 ♀; May 13, 21, Sept. 18, 1943; from A. E. Porsild.

Wing: ♂ ad., 245, 248 mm.; ♀, 220.

Exposed culmen: ♂ ad., 60, 60 mm.; ♀, 55.

Salomonsen, 1935, Aves, in 'Zoology of the Faroes,' p. 41, Copenhagen, recognizes *M. s. major* Schiöler on the basis of its average larger size (wing, 257.04 mm. against 248 mm. in *M. s. serrator*), and the warmer reddish brown on the sides of the neck of young birds and females, this color often extending farther down on the fore-breast. The present material does not support this separation, but compares well with Canadian material.

EUROPEAN GOLDEN PLOVER, *Pluvialis apricaria altifrons* (Brehm).—Godthaab: 1 ♀ ad.; May 29, 1931; from A. E. Porsild. Godthaab: 1 ♂ ad.; May 29, 1944; from M. Dunbar. Godthaab: 1 sex ?, ad.; July 6, 1941 (fragmentary); from A. E. Porsild.

Wing: (chord): ♂ ad., 189; ♀ ad., 187 mm.

The 1931 specimen is included in the long list of occurrences presented by Hørring and Salomonsen, 1941, pp. 24–27; the other two are hitherto unrecorded.

PACIFIC GOLDEN PLOVER, *Pluvialis dominica fulva* (Gmelin).—Godhavn: 1 sex ?, imm.; Sept. 16, 1940; M. P. Porsild.

Wing (chord), 160.

Exposed culmen, 21.

Tarsus, 44.

Compared with a series of *P. d. dominica* in similar plumage, this specimen has much larger yellow markings and yellow edgings on the feathers of the upper parts, with the yellow more bright golden, less dull yellow; the sides of the head, neck and upper breast are heavily washed with pale golden yellow.

This specimen, compared with our series of 18 *dominica* in similar plumage, is strikingly different.

Hørring and Salomonsen, 1941, p. 29, give but two records for this subspecies from Greenland, both taken on the eastern side of the island, and they suggest that their arrival is from Siberia across Europe and the Atlantic Ocean.

This appears to be the first record for west Greenland.

BLACK-BELLIED PLOVER, *Squatarola squatarola* (Linnaeus).—Godthaab; 1 sex ?; July 8, 1941; from A. E. Porsild.

Wing (chord), 190.

Exposed culmen, 28.5 mm.

This specimen adds another Greenland record to the 31 given by Hørring and Salomonsen, 1941, pp. 23, 24.

Ross's GULL, *Rhodostethia rosea* (Macgillivray).—Kronprinsens Island: 1 ad.; 4 June, 1942, Coll. T. C. Rosing, from A. E. Porsild.

Wing (chord), 273.

Exposed culmen, 20 mm.

There are 15 other records for Greenland (Hørring and Salomonsen, 1941, p. 53).

EUROPEAN BARN SWALLOW, *Hirundo rustica rustica* Linnaeus.—Disco Bay: 1 sex ?, ad.; June 14, 1943; from A. E. Porsild.

Wing (chord), 120 mm.

Exposed culmen, 8 mm.

This appears to be the fifth record for Greenland (Hørring and Salomonsen 1941, p. 66).

BLACK-BACKED ROBIN, *Turdus migratorius nigrideus* ALDRICH AND NUTT.—Kangek, Godthaab Fjord: 1 (♂) adult; between Oct. 7 and 21, 1944; M. J. Dunbar.

This specimen, in fresh. unworn plumage, has the feathers of the back of the neck and the back black edged with olive gray. With wear the back would become black.

The specimen is much blacker than most breeding birds from Nova Scotia to Ontario, and compared with worn Newfoundland birds, loaned through Dr. H. C. Oberholser by the Cleveland Museum of Natural History, appears referable to *nigrideus*.

Hitherto the species has been recorded three times in Greenland: Qornoq near Godthaab; Sukkertoppen and Graedefjord. Hørring and Salomonsen, 1941, p. 74, refer the earlier records to *T. m. migratorius* Linnaeus, apparently without considering the then newly described race *nigrideus*. It is probable that all the records belong under the heading *Turdus migratorius nigrideus* Aldrich and Nutt.

I am aware that occasional dark birds, as dark as *nigrideus*, occur in the populations of *T. m. migratorius*, as far west as the Mackenzie delta, and the Greenland specimen might be a dark example of *migratorius*, but it seems advisable to refer it to *nigrideus* on probability.

REFERENCES CITED

OLDENDOW, K.
1933. Fugleliv Grønland. Det Gronlandske Selskabs Aarsskrift, 1932–1933: 17–224.

SCHIÖLER, E. L.
1926. Danmarks fugle. Med Henblik paa de i Grønland, etc., 2. (København.)

SALOMONSEN, FINN
1935. Some records on birds, new or rare to Greenland. Meddelelser om Gronland, 93 (no. 6).

HØRRING, RICH., AND SALOMONSEN, FINN
1941. Further records of rare or new Greenland birds. Meddelelser om Grønland, 131 (no. 5).

PHILLIPS, JOHN C.
1923. A natural history of the ducks, 2.

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Ottawa, Canada

UTAH'S BOOK CLIFFS AND BIRD MIGRATION

BY ROSS HARDY

THE majority of the mountain ranges of western North America have their main axes running in a north-south direction. One of the most important exceptions to this is the Uinta Mountains of northeastern Utah which extend about two hundred miles eastward from the northern Wasatch Mountains into Colorado. The West and East Tavaputs plateaus, located about 100 miles south of the Uintas and running in a parallel direction, are not so well known. The southern face of the West Plateau is much eroded, forming many vertical cliffs varying from 300 to 1500 feet in height. These southern supporting ramparts of these plateaus, known as the Book Cliffs, form the northern boundary of Castle Valley in Carbon, Emery, and Grand counties and the southern boundary of the Uinta Basin. The Green and Price rivers pass through these mountains in narrow, winding canyons.

Price, in Castle Valley (altitude: 5567 feet), is at the southern edge of these cliffs. The summit of the West Tavaputs, less than ten miles north, varies from 9000 feet to 10,050 feet. The cliffs north of Price, in the Kenilworth area, rise very abruptly, having a vertical southern exposure.

Spring bird migration into this region seems to come directly from the south, passing over the low-lying mesas and foothills of the extensive Castle Valley or coming along the Green-Price River system from the southeast. After passing through these low areas, the birds encounter a mountain range standing across their pathway which provides an almost mile-high change in elevation. Perhaps this acts as a temporary obstacle to many birds, especially if there is a dense cloudbank rising another mile or so higher and hiding the upper parts of the mountains. The sheer ledges below the clouds rising hundreds of feet into the thick mists would appear as a barrier. This is believed to retard temporarily the migration of birds in the spring. While the proof for these statements is by no means conclusive, it is believed the idea may be of value to future investigators who may be interested in this problem; at least certain data are best explained on the basis of this hypothesis.

Observations were made by the writer from September, 1933, to May, 1935, at Spring Canyon, in the western part of the Book Cliffs; during 1935–1936 at Sunnyside in the eastern part of Carbon County's Book Cliffs; and from September, 1936, to May, 1938, at Price, on the Price River between the two first-named points.

Usually many more migrants are seen in the spring than in the autumn in spite of the fact that the total population of a species traveling southward after the nesting season is undoubtedly greater than the northward-moving spring population. Some springtime migrating birds delay to feed in this area while waiting for the higher snow-covered areas to the north to become warmer. But not all these birds nest in these mountains, for some of them migrate farther and are not found in the areas immediately to the north.

The Northern Sage Sparrow (*Amphispiza belli nevadensis*) is common in the sagebrush areas of the pigmy conifers and in the greasewood in spring. These sparrows were especially numerous after the beginning of a spring storm. In spite of almost daily visits to the areas around Price, only one autumn record has been obtained—that of a single individual collected on October 10, 1936, in the pigmy conifers. This species was abundant in the same areas from March 17 until April 7, 1937.

Likely when storms are present, the sheer cliffs delay the northward migration and the birds remain at Price and near by. The northern slopes of these mountains are without cliffs and have a more gentle slope, and birds approaching from the north would travel over this gently rising incline for about thirty miles before coming to the abrupt edge of these cliffs that drop to the valley below. Also, thunderstorms of the type which cause high cloudbanks to rest upon the tops of these peaks were observed less often in the autumn than during the spring and summer. Birds such as Sage Sparrows migrating through the area in the autumn, once they reached the summit of the plateau, would no longer be impeded in their flight and would not linger near Price as they did in the spring.

Many clouds rested on the mountain summit north of Price just before sunset on March 16, 1937. A rather heavy rain had ceased and cloudbanks hung east, west, and north. The sun occasionally shone for a few minutes from the west. The mountains and the heavy cloudbanks northward seemed to act as a barrier to further migration, for more Mountain Bluebirds (*Sialia currucoides*) and Western Robins (*Turdus migratorius propinquus*) were in the pigmy forest area on this night than on any other night observed. Flocks numbering from four to twenty individuals were seen in numerous juniper and piñon trees. It was impossible to go more than fifty feet in any direction without encountering these birds. As dusk came on, a few flew north, but their places were filled by arrivals winging their way in from the south. When last seen at dark, the trees were literally filled with Bluebirds and Robins. The last of the northward-passing Montana Juncos (*Junco oreganus montanus*) twittered as they settled down in near-by branches for the night. The next morning, when it was clear weather, these birds had all gone. On other evenings, when the horizon was clear or nearly so, only a very small fraction of this number of Bluebirds and Robins were in these trees, although fully as many were seen winging their way northward.

A week of stormy weather often keeps many waterfowl along the Price River, but immediately upon the clearing of the weather, the waterfowl disappear. During clear weather, far fewer migrants are observed along the river than during stormy weather. So often did this occur that many of the zoology students at Carbon High School commented upon the fact that waterfowl and wading birds, usually rare along Price River, were abundant during stormy weather but were rarely found when the storm ended. Some of the species so affected were the White-faced Glossy Ibis, Brewster's Egret, Treganza's

Heron, ducks, and smaller shore birds. Likely during clear weather these water birds follow the Price River northward through the narrow winding Price Canyon. During stormy periods, the fog in this area would discourage such movement.

During storms along other streams much farther south in Castle Valley, as well as elsewhere in Utah, the writer has not found concentrations of migrating birds to the same extent as that which seems to be caused by the combination of cloudbanks and a long east-west range of mountains in the Book Cliffs region.

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AN ANCESTRAL GOLDEN EAGLE RAISES A QUESTION IN TAXONOMY

BY HILDEGARDE HOWARD

IN studying the eagles of the Rancho La Brea Pleistocene several years ago (1932), I noted certain size discrepancies between the limb bones of the fossil and the modern Golden Eagle. However, as there were available for study, at that time, only a very few skeletons of modern Golden Eagle for comparison with the great series of fossils, no conclusions were drawn on the basis of these observations.

After Harvey Fisher's discovery (1944) of the small but important differences between the fossil and living California Condor, it appeared wise to review the subject of the Golden Eagle in more detail. A considerably greater number of modern bones are now available for comparison, numbering from 20 to 30 for all important limb elements, and about 18 skulls. The available fossil bones, however, still far exceed the modern, in most instances.

With regard to limb elements, the most outstanding distinction between fossil and Recent bones lies in the fact that, whereas the fossil humeri and ulnae average larger than the modern, and attain a maximum of 10 mm. greater length, the tarsometatarsi average shorter, and none of the 660 bones equals the maximum for the Recent eagle. Unfortunately, in no instance in the fossil series are wing and leg elements of individual birds associated. It is hardly proper, therefore, to state definitely that the Pleistocene eagle had relatively shorter legs and longer wings than the living bird, although the evidence from disassociated bones points in that direction.

Examination of individual bones in series of each limb element does not show any proportional or structural differences between fossil and modern bones.

It is in the skull that the most marked distinctions occur between the Pleistocene and Recent eagles. The fossil bird has a heavier mandibular structure, and both upper and lower mandibles show greater sturdiness. Associated with the strong mandibles is evidence of more powerful jaw muscles. The temporal area of the skull is enlarged by the outward extension of the postorbital processes, and by the encroachment of the temporal scars farther toward the middorsal line. (This condition is best expressed by a measurement of the distance between the scars at the posterodorsal line of the cranium.) The outward-protruding postorbitals give the skull the appearance of being low as well as broad through the cranium, although the measurements of height of cranium are the same in the two series.

The rostrum averages markedly broader in the fossil series and there is a slight tendency to greater height as well. The lower mandibles display a distinct bowing outwardly, and the individual rami appear heavy, whereas the modern jaws are relatively straight and slender. Unfortunately, however, the series of complete fossil mandibles is small (only 15 complete specimens), so that a full range of size is probably not represented.

The following measurements demonstrate the differences between the Pleistocene and Recent skulls. Measurements are in millimeters.

	Fossil			*Recent*			*Number of specimens*		*Percentage of overlap*
	max.	*mean*	*min.*	*max.*	*mean*	*min.*	*fos.*	*Rec.*	
Breadth of cranium across postorbital processes	71.0	68.1	63.7	66.0	63.1	61.0	31	18	30
Height of cranium	41.6	40.5	39.0	41.8	40.5	38.8	33	17	100
Height of cranium relative to breadth across postorbital processes (per cent)	61.6	59.9	57.2	66.4	64.3	62.6	25	17	none
Distance between temporal scars	36.0	31.1	27.4	39.0	36.0	32.3	71	18	27
Distance between temporal scars relative to breadth of cranium back of postorbitals (per cent)	74.5	66.6	55.5	85.3	79.0	73.6	71	18	3
Breadth of rostrum below nares	22.7	20.3	18.2	18.3	16.6	14.7	49	15	9
Breadth relative to length of rostrum	62.8	58.9	54.2	55.5	51.0	46.8	42	15	7
Breadth across rami of lower mandible	46.8	43.3	38.8	37.4	33.7	31.6	15	18	none

Reviewing the skull characters, a typical Pleistocene Golden Eagle had a relatively low, flat, and broad skull with heavy, broad beak and strong jaw. Though the 'typical' specimens can be easily distinguished from Recent skulls, there are a number of fossil skulls which tend toward the modern in one or more characters. Considering this intergrading of skull characters, as well as the impossibility of distinguishing individual limb elements, it seems apparent that the *Aquila* which frequented Rancho La Brea in the Pleistocene was directly ancestral to modern *A. chrysaëtos*. The differences which

exist between the two populations are relatively slight, and the gradual conversion of the one into the other seems not impossible over a period of thousands of years. Contributing to this theory is the occurrence of two crania from a pit considered to be of more recent age than the typical Pleistocene deposits, namely Pit 10. Both specimens have a breadth across the postorbitals near the maximum for the Recent form, but in the zone of overlap between the Recent and fossil. In one, the relative size of the temporal scar and the relative height of the cranium fall entirely in the Recent range. In the other specimen, however, one ratio falls into the fossil range, the other into the very small zone of overlap.

It is not often that the paleontologist is afforded the opportunity of observing cases of direct ancestry. Ordinarily, fossil discoveries are discontinuous. In the later Pleistocene deposits, however, particularly in those like the Rancho La Brea beds where it is possible to study series large enough to consider species as groups rather than isolated individuals, evidence of actual transition of fossil into Recent forms begins to be revealed. Though discontinuous occurrences provide a simpler study from the point of view of the mechanics of taxonomy, these Pleistocene-Recent mergings are far more enlightening.

The case of the Golden Eagle is not an isolated occurrence. Harvey Fisher's work on the California Condor revealed a similar case, and I have noted others from Fossil Lake, Oregon (1946). Undoubtedly, now that we are awakened to the possibilities at hand, still other modern species now recorded from the Pleistocene will be found to vary in some degree from the living forms when large series are available for study.

Osteologically these ancestral groups differ from the related living forms in only one or two elements, and even in these, the distinctions, though evident, are not marked. Only in deposits yielding large series of specimens has it been possible to recognize their importance.

The question now arises as to the proper taxonomic treatment of these forms. Should they be considered as distinct species, and so named, or should the trinomial be brought into use? In reviewing the Pleistocene birds of Fossil Lake, Oregon, I encountered two instances where both an existing species and a related extinct form had been recorded. Upon careful study of a large series of bones, it became evident that in each case a single species was represented, to me obviously ancestral to the modern form. In view of the considerable overlap which occurred between these Pleistocene forms and their descendants of today, I decided upon the use of the trinomial

to designate the Pleistocene intergrading ancestors, using the trinomial here not as an expression of the geographic subspecies but of its equivalent in time. This decision was fortified by the publication of a paper by George Gaylord Simpson (1943) on species criteria in paleozoology, in which he recommends such usage for divisions of groups which are essentially continuous in time.

Whether or not this is the ultimate solution for designating this type of ancestral form remains to be seen. It has been argued that if complete records of all creatures which have ever lived were obtainable, the continuity of life forms would admit of no separation at all if time is considered comparable to space in the designation of taxonomic groups. However, no such complete record will ever be available, and, recognizing taxonomy for the artificial tool which it is, should there not be some distinction between very closely related temporal forms and clearly distinct groups?

In the usual fossil occurrence, yielding a few isolated bones, specimens of these ancestral forms would likely be assigned to living species, since it is impossible to separate the fossil from the modern in many elements. If the Pleistocene ancestors are given distinct specific names, species assignments (in many instances) may become contingent upon knowledge of the age of the deposit.

The recognition of the minor distinctions in these Pleistocene aggregations, which were once thought to be identical with modern forms, is a new concept to the avian paleontologist. As I have said before, undoubtedly such occurrences will continue to be revealed now that we are aware of the possibility. This is, therefore, a propitious time to give careful thought to the subject as a whole, rather than to consider each individual case singly as it appears. In this way we may hope to establish a line of procedure which will unify our taxonomic treatment of all such instances. At present the decision as to allocation rests with the individual worker, with the result that some forms bear the trinomial, while others of similar status are treated as distinct species.

It has been said, and with justification, that the paleontologist's species concept necessarily differs somewhat from that of the student of living birds. I have, therefore, brought the subject before this group of working ornithologists in the hope of arousing pertinent discussion.

LITERATURE CITED

FISHER, HARVEY

1944. The skulls of Cathartid vultures. Condor, 46: 272–296, 6 figs. in text. *See* pp. 289–292.

HOWARD, HILDEGARDE

1932. Eagles and eagle-like vultures of the Pleistocene of Rancho La Brea. Carnegie Inst. Wash., Pub. 429, 82 pp., 29 pls., 3 figs. in text. *See* p. 31.

1946. A review of the Pleistocene birds of Fossil Lake, Oregon. Carnegie Inst. Wash., Pub. 551, pp. 141–195, 2 pls. *See* pp. 147–151 and 182–183.

SIMPSON, GEORGE G.

1943. Criteria for genera, species, and subspecies in zoology and paleozoology. Annals N. Y. Acad. Sci., 44: 145–178. *See* pp. 170–177.

Los Angeles County Museum
Los Angeles 7
California
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BREEDING HABITATS OF CERTAIN WOOD WARBLERS IN THE UNGLACIATED APPALACHIAN REGION

BY MAURICE BROOKS

THE unglaciated Appalachian Mountain region, from Pennsylvania southward, has long been noted, among ornithologists, for the breeding here of many species of birds generally associated with more northern regions. It has not been so well recognized that a good number of such species nest in the region in habitats which often differ radically from those usually occupied in other portions of their ranges.

Although there are other bird groups which show a tendency to occupy, locally, habitats at variance with their more common practices, this behavior is best illustrated by the wood warblers, Family Compsothlypidae. Wood warblers in the region display a great deal of plasticity in their choice of nesting sites. Most of the original timber which clothed the mountain slopes and high plateaus has been removed. From many of the mountains the spruce-fir forest of high elevations has practically disappeared. To a lesser degree, the birch-beech-maple forests, and the birch-hemlock forests have been destroyed or greatly disturbed. The oak-hickory-chestnut forest has undergone a profound transformation with the death, from the chestnut bark disease, of the chestnut, a dominant species in many areas.

Despite abrupt changes in the character of the forests, most warbler species have shown an amazing power of adaptation to new surroundings. The mountains have lost, in the time of ornithologists at least,

no species, and there are some species whose ranges have been considerably extended. This plasticity, resulting in the ability to occupy habitats and find nesting sites which, in other portions of the birds' ranges, would be considered unusual, can best be shown through specific examples.

GOLDEN-WINGED WARBLER, *Vermivora chrysoptera.*—In the unglaciated Appalachian region this is a characteristic bird of the oak-chestnut forests. It is most common on dry, brushy ridges between 2000 and 3000 feet elevations, where dead chestnut stubs are still standing. Males regularly select dead chestnuts as their singing perches. In the openings where the mature chestnuts have died, and where the abundant sprouts alternately grow and die of blight, the birds find nesting sites. They are seldom found in the river valleys, even where there are swamps and marshes. I have referred to this sprout growth (Brooks, 1940) as the "chestnut-sprout association," since it is a definite, widespread community, with a highly interesting bird life. Odum and Burleigh (1946) have discussed it at some length, and have written of the birds which find nests in this disclimax growth.

PARULA WARBLER, *Compsothlypis americana.*—The northern and southern races of the Parula Warbler meet and overlap territories in the unglaciated Appalachian region. Throughout the south, the southern race habitually nests in long moss (*Tillandsia*). In the north, the bird selects clumps of the superficially similar lichens, *Usnea* and *Cladonia usneoides,* in which to construct its nests.

The southern Appalachian region has no long moss, and relatively little *Usnea,* yet the birds are widely distributed, and often abundant, throughout the region. Nor are they restricted to coniferous or evergreen forests. They nest in southern mixed hardwoods, oak-chestnut-hickory, oak-pine, in the so-called "Appalachian forest," in northern hardwoods, in white pine, in hemlock, and at the borders of the red spruce forests. As is indicated by their occurrence in a wide variety of timber types, they nest at practically all elevations throughout the region save, perhaps, on some of the highest peaks. Although they may be somewhat more abundant in hemlock forests, they often nest in pure deciduous stands, and I have found nests in dense clumps of leaves at the ends of white oak and sycamore branches.

MAGNOLIA WARBLER, *Dendroica magnolia.*—This is another species which makes a wide choice of nesting habitats. It occurs in the mountains from the summits down to about 1200 feet, breeding in spruce-fir, northern mixed, and somewhat more sparingly in the northern

hardwood and oak-hickory-chestnut forests. Where the high ridges are covered with chestnut sprouts, however, the bird is common, making its nests in the dense clumps of dead chestnut twigs. In many cases the communities selected have no coniferous trees of any kind.

BLACK-THROATED BLUE WARBLER, *Dendroica caerulescens.*—This species, including the southern race, Cairns's Warbler, is a frequent companion of the Magnolia Warbler, occurring in every timber type occupied by the latter species. It is a characteristic bird of the "chestnut sprout association," and often nests well removed from any conifers.

BLACK-THROATED GREEN WARBLER, *Dendroica virens.*—Customarily associated with hemlock woods, this bird is notable in the Appalachian region for its wide choice of nesting sites and habitats. It breeds from elevations of 500 feet to the highest mountain peaks, and it occurs in every timber type in the region. On dry oak-hickory ridges, far removed from any conifers, it is often a characteristic species. I have seen nests placed in white oak and beech trees, and fastened to a wild grape vine.

BLACKBURNIAN WARBLER, *Dendroica fusca.*—Although very common in coniferous stands, the Blackburnian Warbler is also common on the dry chestnut ridges, where, like the Golden-winged Warbler, it frequently sings from the top branch of a dead chestnut or oak tree.

CHESTNUT-SIDED WARBLER, *Dendroica pensylvanica.*—As might be expected, this species is the most common and characteristic warbler of the "chestnut sprout association," being found practically throughout the region at elevations of 1500 feet or more. The brushy second growth which now clothes so many of the Appalachian slopes is, apparently, exactly suited to the needs of this species, although it nests about openings in the spruce stands as well.

MOURNING WARBLER, *Oporornis philadelphia.*—Reaching its southern breeding limits in Virginia and West Virginia, this is a characteristic, and often abundant, species in the "chestnut sprout association" above 3000 feet. It breeds also in the spruce forest openings, but is generally more common in deciduous stands.

CANADA WARBLER, *Wilsonia canadensis.*—This species is most common in rhododendron tangles under spruce or hemlock forests, but it is also often found in the dense sprouts and brier stands of the "chestnut sprout associations." In such situations it is frequently far removed from any conifers today, although there may be stands of *Kalmia* and other broad-leaved evergreens in such situations.

To recapitulate, every one of the warblers which I have listed, save the Parula, is at least locally common in the "chestnut sprout asso-

ciation," and all are found today in habitats entirely disssociated from coniferous stands or remnant conifers.

Having stated the facts as they are known, it seems desirable to enter the field of pure theory in an attempt to explain a situation which will seem highly aberrant to most northern bird students. I believe that the explanation may lie in the conditions which prevailed during the Pleistocene. At least four times during this recent geologic period, advancing ice sheets effectively barred great sections of the North American continent to land-nesting birds. As glacial ice advanced, there must have been, just south of the ice mass, a cumulative piling up of birds which had habitually nested northward.

Of perhaps equal importance in unsettling the breeding habits of many species were the spectacular climatic fluctuations which occurred during interglacial periods. It has been shown that presently existing lakes in northern Ohio and Indiana were, at such times, completely dried up on two occasions, the lake beds being covered over with mesophytic forest. The Dismal Swamp in Virginia has undergone similar fluctuations. The piling up of great numbers of birds just south of the ice mass, followed by comparatively rapid recession of the ice, with resultant changes in the vegetation, must have led to constantly shifting bird populations, with resultant breakdown of breeding habits and territorialism.

It may be pointed out that birds accustomed to nest in the coniferous forest had larger areas of such forests in which to breed during times of glacial advance. To a limited extent, this was doubtless true, since there is evidence that the spruce-fir forest extended along the mountains at least as far as South Carolina. On the other hand, the great mixed-mesophytic Tertiary forest of the Allegheny and Cumberland plateaus seems not to have been greatly modified by glaciation, and it may be presumed that there were forests of oak-hickory-chestnut and oak-pine, as well as northern hardwoods, during Pleistocene times not far south of the line of glacial ice.

There is some evidence to show that enforced piling up of birds of any given species in an area will result in a greatly increased breeding population within that area. There is a wealth of evidence, moreover, to show that some individuals within a given species are sufficiently plastic in their breeding habits to adapt themselves to new sites and new breeding conditions.

If this theory be tenable, therefore, we might expect that birds forced out of their traditional breeding grounds, and coming into competition with others of their kind in a new territory, would find homes in new vegetational types, wherever unoccupied niches pre-

sented themselves. As we have seen, this is precisely the condition which obtains today for many northern warblers in the southern Appalachian region.

Perhaps the key to this situation lies in varying degrees of plasticity among individuals of the same species. This individual variation need not be too surprising in the light of Chimney Swift behavior since the coming of the white man. Many of these birds have moved to the city or the village to occupy man-made structures, but others, rugged individualists, have quite literally clung to the hollow trees of their ancestors.

We may postulate, therefore, that the conservatives among the wood warblers moved northward as the ice receded, to reoccupy nesting sites in the traditional coniferous forests of their ancestors. Pioneering individuals, however, having learned that it was possible to nest in deciduous forests of various types, may have remained over wide areas of the unglaciated Appalachian highlands, carrying on and extending the new behavior pattern.

This ability to adapt readily to new conditions may explain the striking association of warblers in chestnut sprout areas in the southern highlands. These birds are biologically sound, a sort of avian "left wing," undismayed by change and ready to use it, when it comes, to their own advantage.

SUMMARY

1. This paper discusses the breeding of certain wood warblers in the unglaciated Appalachian region, where they are to be found in habitats radically different from those occupied northward.

2. Many of these warblers breed in areas of chestnut sprouts which have followed the death from blight of mature chestnut trees.

3. The theory is propounded that crowding of birds in the area just southward of glacial ice, coupled with rapid and marked climatic fluctuations in interglacial periods, led to changed breeding habits among certain individuals, and that these habits have persisted to the present time.

LITERATURE CITED

BROOKS, MAURICE
1940. The breeding warblers of the central Allegheny Mountain region. Wilson Bulletin, 52 (4): 249–266.

ODUM, EUGENE P., AND BURLEIGH, THOMAS D.
1946. Southward invasion in Georgia. Auk, 63 (3): 388–401.

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THE RACES OF MacGILLIVRAY'S WARBLER

BY ALLAN R. PHILLIPS

CURRENT literature treats the MacGillivray's Warbler (*Oporornis tolmiei*) as a distinct and unvarying species. This, however, is not a true representation of the facts. There is much geographic variation within MacGillivray's Warbler, and it is doubtful that it is really a species distinct from the Mourning Warbler (*O. philadelphia*). The question of specific distinction requires field studies beyond the scope of the present paper, but it is clear that the two are very closely related. The only distinction which holds for immature birds is the relative tail-length, and even here some overlap is found; furthermore, those populations of *tolmiei* that breed nearest to *O. philadelphia* are closer to that species in relative tail-length than are those populations breeding farther south. The only constant color difference, the white spots on the eyelids, is of use only for adult birds (after the first prenuptial molt).

MacGillivray's Warbler is one of a number of birds whose taxonomy cannot be understood without first knowing its times of migration. In the Lower Sonoran Zone valleys of southern and central Arizona, where it surely does not breed, it was still "quite numerous" on May 27, 1884 (Mearns, MS.), and is recorded to June 8 (*see* Brewster, Bull, Nuttall Orn. Club, 7: 139, 1882); on its return I have found it as early as August 6. Therefore, only birds taken between June 10 and July 30 may be reasonably assumed to be breeding birds; and at that season many birds are in very poor plumage.

Cases such as this (which is by no means an extreme one) emphasize the importance of noting on the labels of all specimens collected accurate data concerning the sexual condition, sex, and age, actions (if outstanding), and type of country (plant cover). All too often the collector throws away valuable data to save five seconds' writing.

In order to understand fully the geographic variations that were very evident in a mere handful of specimens, therefore, it was necessary to study large series of birds. For the privilege of making these studies, I am indebted to the authorities of the Museum of Comparative Zoölogy, and especially to Dr. L. C. Sanford and the authorities of the American Museum of Natural History, the United States National Museum, and the Fish and Wildlife Service.

Considering its extended migrations and the zonal, ecological, and geographic restriction of its breeding range, MacGillivray's Warbler shows a surprising amount of geographic variation. This results from two clines, one from dull color to bright, proceeding westward; the

other from short tail to long, proceeding southward. There is also a slight tendency to small size in the Pacific Northwest. Four races may be distinguished:

(1) **Oporornis tolmiei tolmiei** (Townsend)

Sylvia Tolmiei Townsend, Narr. Journ. Rocky Mts.: 343, April, 1839 (Columbia River [= Ft. Vancouver, Wash.]).

Sylvia Macgillivrayi Audubon, Orn. Biog., 5: 75, June, 1839 (banks of the Columbia [= Ft. Vancouver, Wash.]).

(?) [*Trichas*] *vegeta* "Licht." Bonaparte, Conspectus Gen. Av., 1: 310, 1850 ("Mexico").

Subspecific characters: Upper parts more yellowish green, and under parts averaging deeper and more orange yellow, than in other races.

Range: Breeds along the Pacific coast from southwestern British Columbia to Marin Co., California. On migration east to the Sierra Nevada, central and southeastern Arizona, and exceptionally the Guadalupe Mts., Texas. Winters from southern Baja California and Sonora (Alamos) to Guatemala, rarely to Nicaragua (San Rafael del Norte) and Costa Rica (San José, May, unusually brown above). This race may breed inland to the Cascade Mts., whence I have seen no definitely breeding birds.

The name *vegeta* is unidentifiable. Its description (*"annulo oculari albido"*) fits *O. agilis* best, but would apply to almost any immature *Oporornis*. Cabanis (Journ. für Orn., 9: 84, 1861) placed it in the synonymy of *tolmiei*, but he may not have realized that *philadelphia* also occurs in México and is indistinguishable in plumage. Probably *vegeta* was a composite name based on various races or species of *Oporornis;* and even if an unquestionable type specimen should come to light, it is doubtful that it would be in suitable condition for accurate racial determination. With all these matters in doubt, it is best to follow Cabanis and list *vegeta* as a probable synonym of *tolmiei*.

(2) **Oporornis tolmiei monticola,** subsp. nov.

Type: No. 223, collection of Allan R. Phillips; male in breeding condition; Hart Prairie, San Francisco Mt., Arizona (gooseberry association, lower Canadian Zone); June 13, 1938; collected by A. R. Phillips (orig. no. 351).

Subspecific characters: Tail relatively longest; color dull, differing from *O. t. tolmiei* in darker and grayer (less yellowish) green upper parts and paler and greener (less orange) yellow under parts. The difference in color of the under parts is less constant in fall females

of unkown age, perhaps due to variation with age and to erroneous sexing of some young birds.

Range: Breeds in dense deciduous brush of the Canadian Zone from southeastern Oregon (Steens and Mahogany Mts.) and southwestern Wyoming (Ft. Bridger and Steamboat Mt.) south to central Arizona (White and San Francisco Mts.) and central New Mexico (Alto). In spring migration in Texas (Van Horn, Pecos City, and Menard), and in fall from southeastern Arizona (near Oracle, Fort Huachuca) to Madero Creek, "Presidio Co.," Texas. Winters from the plains of Colima, Michoacán (Patamban, Zamora), and Mórelos (Yautepec) to Guatemala (Panajachel).

The birds of southeastern Idaho (Malad, Inkom) and the central-eastern edge of Oregon seem intermediate toward the next race. Having defined the ends in the chain of races, we may proceed to discuss the intermediate links.

(3) **Oporornis tolmiei austinsmithi,** subsp. nov.

Type: No. 268434, United States National Museum, Fish and Wildlife Service collection; male; Emigrant Gulch, 6500 feet alt., 3 miles southeast of Chico, Montana, July 13, 1917; collected by M. A. Hanna (orig. no. 172).

Subspecific characters: Closely resembling *O. t. monticola,* but tail relatively shorter. Normally, tail in males, 56.5 mm. or less, and 4.5 mm. or more shorter than the chord of the wing. The reverse is true of *O. t. monticola* (tail normally, 56.5 or more, and only up to 4.5 mm. shorter than the wing). In females there appears to be great overlap in absolute tail length, and proportions are more apt to be diagnostic; the series is inadequate.

Range: Breeds from southeastern British Columbia (Yellowhead Lake) and the Cypress Hills, Saskatchewan, to central Wyoming. In migration from Texas westward, rarely, to southeastern California (Coso Coso Mts.). Winters from Sinaloa (Escuinapa) and Guatemala to Chiriquí, but apparently rare in winter in México; the principal winter range seems to be from Guatemala to Nicaragua.

This race is named in recognition of the services of Austin Paul Smith to western ornithology. His writings and carefully annotated specimens have helped to clear up the status and variations of this and other migratory birds.

This race impresses me as being smaller than *monticola,* but with a relatively longer wing. Possibly there may be some difference in weight.

(4) **Oporornis tolmiei intermedia,** subsp. nov.

Type: No. 384003, American Museum of Natural History; male; Okanagan, British Columbia, June 23, 1906; collected by Allan Brooks.

Subspecific characters: Somewhat duller than ***O. t. tolmiei,*** but brighter than *austinsmithi,* which it resembles in proportions over most of its range. Thus it is exactly intermediate between the coastal and eastern races.

Range: Breeds from northern British Columbia (Telegraph Creek; Second South Fork, 50 miles east of Telegraph Creek) south over most of British Columbia, Washington, and Oregon east of the Cascade Mts., and through the Siskiyou Mts. region to the Sierra Nevada and probably other parts of California. Migrates east to Montana (Gallatin Co.), Colorado (Antonito, Colorado Springs, etc.), Texas (Ingram, Fort Clark), and Tamaulipas (Mier), and west to Marin Co., California (rarely). Winters from southern Baja California (rarely) and Sonora (Alamos, Feb. 29) to Nicaragua (Ocotal) and even Chiriquí (Boquete), but principally from Michoacán (Mt. Tancitaro) to Guatemala.

It is the widespread range of this intermediate race which causes most of the difficulty in identifying migrants. It breeds over the bulk of all the Pacific coast states and provinces, and perhaps even into northwestern Idaho; a May male from Coeur d'Alene is *intermedia,* but may be a transient. Birds from the eastern edge of northern Oregon are variable, but here, too, *intermedia* may be a transient. Idaho seems to be an area of intergradation between three different races.

Intergradation between *intermedia* and *monticola* occurs in southeastern Oregon. To the west, birds from Roseburg and Grant's Pass, Oregon, seem nearer *intermedia* than *tolmiei.* A June bird from Monterey, Calif., seems to be *intermedia,* which may thus breed over most of the California range of the species.

Breeding birds from the Sierra Nevada differ from more northern *intermedia* in their brighter average color below, longer tails, and often retarded plumage in the males (head seldom entirely dark), but the differences are very slight, and the resemblance is close; migrants must be called *intermedia.*

The only measurements of value in identifying the subspecies are the tail and the difference between wing and tail. In some birds I measured the flattened wing, in others the chord (the difference between flattened wing and chord is about one millimeter) and the method used is given in each case. The table of measurements in-

cludes only birds of known sex taken on their presumed breeding grounds. Immatures are included, as their measurements do not seem to differ from those of adults. "Difference" is the wing minus tail of each individual bird.

TABLE OF MEASUREMENTS (in millimeters)

	Flattened wing		*Chord of wing*		
	Number measured	*Difference*	*Number measured*	*Difference*	*Tail*
MALES					
monticola	10	3.95(2.5–6)	10	2.9(1.3–5.5)	58.4(55–62.2)
austinsmithi	5	8.3(6.8–10)	10	6.0(3–8.4)	54.0(51.6–56.5)
intermedia (Brit. Col.)	5	8.2(8–8.3)	1	7.0	53.3(49.9–56.4)
intermedia (Sierra Nev.)	8	5.7(4.8–7.6)			54.8(53.1–56)
tolmiei (Marin Co., Cal.)	5	6.0(5.1–6.8)			55.2(52.8–57.2)
tolmiei (Brit. Col.)	7	7.0(4.9–8.4)			52.1(48.8–54.1)
FEMALES					
monticola	2	4.15(2.8–5.5)	6	2.7(2–3.6)	54.7(53.2–57.6)
austinsmithi	4	7.0(5.5–8)	4	5.8(5.3–6.8)	52.0(49.8–54.2)
intermedia (Brit. Col.)	2	6.3(6–6.6)	1	5.4	52.5(51.3–54.5)
intermedia (Sierra Nev.)	7	6.0(4.9–7)			52.6(51.7–54.9)
tolmiei (Marin Co., Cal.)	1	5.3			52.2
tolmiei (Brit. Col.)	3	6.3(5.5–7.4)			51.0(49–53.9)

Tucson
Arizona

JOSEPH MAILLIARD, 1857–1945

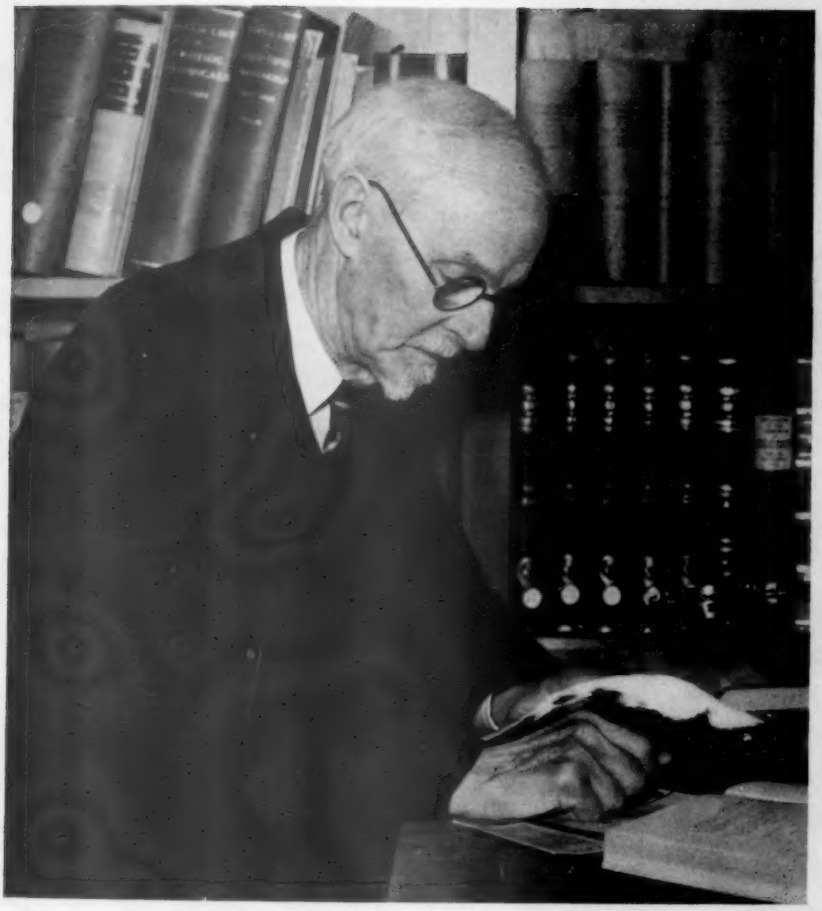
BY ROBERT C. MILLER

Plate 10

IN the spring of 1873 a fifteen-year-old boy visited the Yosemite Valley. Riding horseback along Glacier Point trail, he flushed a bird from its nest, collected one egg, and transported it safely the rest of the day in his pocket handkerchief. The bird was a Townsend Solitaire and the boy was Joseph Mailliard.

Seventy-two years later, on December 12, 1945, Joseph Mailliard died, full of years and honors, only a few days prior to the eighty-eighth anniversary of his birth. During all the intervening period his life was intimately bound up with the history of ornithology in California.

Joseph Mailliard was born in Bordentown, New Jersey, on December 30, 1857. His father and his grandfather before him had been secretaries to Joseph Bonaparte, brother of Napoleon. His mother was a sister of Julia Ward Howe. The amalgamation of the French and the New England heritages could not fail to be felicitous. Those who knew Joseph Mailliard's eager intellect, sterling character



Joseph Mailliard

and vivacious personality sometimes asked themselves: "Which trait is French and which is American?" But they never found the answer.

In 1868 the Mailliard family moved from New Jersey to San Francisco, and in 1873 they settled on a ranch in Marin County, the Rancho San Geronimo, eight miles west of San Rafael. Life on a ranch provided an ideal setting for the development of an interest in natural history. Joseph and his brother, John Ward Mailliard, both became keenly interested in collecting. From Charles A. Allen, who lived near by and collected specimens to sell to eastern collectors and museums, they learned how to prepare bird skins and how to make and care for a scientific collection of birds, nests and eggs. The interest developed at this time proved permanent, and the two brothers worked together on a collection of increasing scientific value, which ultimately grew to about 14,000 specimens of birds, a somewhat larger number of eggs, and several hundred nests.

Joseph Mailliard entered the University of California with the class of 1878, but took two majors, in mining and chemistry, and planned to graduate with the class of 1879. A few weeks before graduation he developed pneumonia and had to withdraw, and this terminated his formal education. Subsequently he engaged in business and ranching.

Of a wiry but never a robust constitution, he had frequent struggles with ill health. Twice his physician prescribed a familiar remedy of those days, an ocean voyage. This led him to visit Alaska in 1896 and Chile in 1902. Both trips were really ornithological expeditions, which added greatly to the Mailliard collection of birds and eggs. The collection made in Chile, numbering several hundred birds, quite a number of eggs, and some specimens of insects, was deposited with the California Academy of Sciences, where unfortunately it was destroyed in the earthquake and fire of 1906.

By an odd coincidence, it was on the Alaskan journey that Joseph Mailliard became acquainted with Joseph Grinnell, then a boy of nineteen on a youthful adventure. This acquaintance ripened into a long friendship characterized by field trips together, scientific collaboration and happy association in the affairs of the Cooper Ornithological Club, the California Academy of Sciences, and the American Ornithologists' Union.

The association of Joseph Mailliard with his brother, John Ward Mailliard, was always intimate, and they worked together on their ornithological collections. In 1904 they built adjoining homes in San Francisco, and the collection was installed in a basement room

designed for the purpose. In an autobiographical sketch written for 'The Condor' (26: 10–29, 1924) Joseph Mailliard wrote: "For many years thereafter, we two used to meet in this room in late afternoons, on half-holidays, and Sunday mornings, to classify, arrange, and work over our collection."

In 1918, soon after the California Academy of Sciences had moved into a new, fireproof building in Golden Gate Park, the Mailliard brothers decided to donate their collection to that institution. In 1919, Joseph Mailliard was appointed Honorary Curator of the Department of Ornithology and Mammalogy in the Academy, a position which soon developed into that of active Curator. Thus at length, at the age of 62, he found himself in a position to devote his entire time to his lifelong interest.

With an energy and enthusiasm that would have been unusual in a man thirty years his junior, he entered upon his new assignment, camping out for weeks at a time on his extensive field trips, caring meticulously for the collections in his charge, and contributing steadily to scientific journals. Among his notable faunal reports may be mentioned those on the Modoc, Plumas, and inner Coast Range regions of northern California. His contribution to the literature of vertebrate zoology is represented by the impressive total of about 160 separate papers.

In 1927, having reached the age of seventy, Mr. Mailliard retired from the active curatorship of the department and was appointed Curator Emeritus. His retirement, however, meant only a withdrawal from executive responsibilities. He remained active in the curatorial work of the department until well past eighty, and only gradually and reluctantly gave it up as failing strength increasingly confined him to his home.

Joseph Mailliard became an Associate of the American Ornithologists' Union in 1895, was elected a Member in 1901 and a Fellow in 1913. Always a good companion, a wit and a raconteur, he was known and loved in ornithological circles from coast to coast. His long life-span, his wide acquaintance and his friendliness to youth combined to give many a younger ornithologist a valued sense of continuity with the past and of fellowship with greatness.

A son, Ernest C. Mailliard, survives him.

GENERAL NOTES

Vieillot's names for the Wild Turkey.—Louis Jean Pierre Vieillot gave two different technical specific names to the Wild Turkey in a single year. Both are based on William Bartram's description as it appeared in a French translation, 'Voyage dans les parties suds de l'Amérique septentrionale' (1: 46, 1799), but Bartram's name for the bird is not cited as implied in the 1931 A. O. U. Check-List. Vieillot's names, to which we refer, appeared in the 'Nouveau Dictionnaire d'Histoire Naturelle,' nouv. éd., vol. 9, 1817. So far as title page of the volume is concerned, there is no clue to the different namings of the turkey that occur in the work. In the original form of the volume, we find on p. 447 the wording: "Le Dindon Sauvage, *Meleagris silvestris* Vieill." According to the notes of the lamented Charles W. Richmond (kindly sent to me by Alexander Wetmore), this version was published in March, 1817. In June, 1817, according to the same authority, appeared copies of this volume with a revised sheet (pp. 447–448) tipped in. In such copies the insert and stub are plainly evident, but to make identification easy and positive, the first lines of the two printings of page 447 may well be quoted. They are: March printing—"dans le front. Lorsque l'oiseau mâle est tranquille, cette ca . . ."; June printing—"de petites plumes encore plus rares sur le cou. Une caroncle . . .". In the reprint, the reference to the turkey is "Le Dindon Sauvage, *Meleagris fera* Vieill." Why Vieillot made the change seems to be unknown, but under current nomenclatorial practice, the action is of no effect, emendations being ignored. There have been misunderstandings and controversy as to priority of *silvestris* and *fera*, renewal of which may be obviated by the hints here given as to recognition of the two versions. It would be helpful also if bibliographical citations of these names would distinguish the March, and June, 1817, printings of the pertinent pages in the Dictionnaire.—W. L. McAtee, *Chicago, Illinois.*

Pterylography of the drongo (*Dicrurus modestus coracinus*).—While cataloguing the anatomical collection of the Department of Birds of the American Museum of Natural History, New York, the author had opportunity to study the pterylographical characters of the African drongo, *Dicrurus modestus coracinus*. The specimen, collected by Dr. James Chapin on the Chapin-Mathews Expedition, was not clipped, since the thorough wetting of the plumage by alcohol allowed the feathers to be easily manipulated.

Pteryla ventralis simple on neck and very narrow, furcating at base of neck to form the pterylae ventrales trunci; pteryla ventralis trunci moderate in width anteriorly, narrowing posteriorly, and uniting with its fellow to surround the cloaca; an isolated pteryla of one row on side of pectoralis major muscle, lateral to pteryla ventralis trunci; humeral tract connected to ventral tract by a partly uniserial, partly biserial row of feathers running from anterior extremity of pteryla humeralis to pteryla ventralis trunci just anterior to insertion of humerus; femoral tracts isolated; pteryla dorsalis simple, broadened into a rhomboidal area in middle of back, between posterior extremities of scapulae, narrowing posteriorly, its posterior extremity forked to enclose the nude oil-gland; one row of upper tail-coverts; rectrices ten..

The pterylosis seems somewhat unusual for a Passeriform bird in the posterior point of furcation of the pteryla ventralis and in the isolated outer pectoral tract. The pterylae are narrow, the feathers with aftershafts of the passerine type.—Sam McDowell, *3066 Federal St., Camden, N. J.*

A very early notice of hawk migration.—Oviedo, writing about thirty years after Columbus discovered America, was the first American naturalist, and his 'Historia general y natural de las Indias, islas y tierre-firme del mar oceano' is the first American natural history, containing descriptions of many of the animals, birds, reptiles and fishes found in the regions occupied by the Spaniards. Unfortunately, his work is not commonly found in an English translation. However, parts of it occur in 'Purchas, his pilgrimes' (James MacLehose and Sons, Glasgow, 1906). Many of his descriptions are surprisingly accurate, and all of them are most interesting.

Such a passage is the one in which he gives what is probably the first lucid account of the hawk migration. I give it below, in the old English of the Purchas translation.

"Every yeare," he says, "there pass from the end of Cuba infinite numbers of divers sorts of Birds, which come from the North of the firme Land, and crosse over the Alacrain Ilands and Cuba, and flye over the Gulfe Southwards. I have seen them passe over Darien [Isthmus of Panama] and Nombre de Dios and Panama in divers yeares, in the Firme Land; so many that they cover the Skie: and this passage or march continueth a moneth or more about the moneth of March. I thinke they flie round about the World, for they never are seene to returne toward the West or North; and we see them not every yeare one after another; from morning to night the aire is covered, and some flie so high that they cannot be seene, others lower yet higher than the mountains tops. They come from the North-west and North to the Southwards, and then turn South-west, occupying in length more than the eye can discerne, and a great space in breadth. The lowest are the Eaglets and the Eagles, and all seeme Birds of prey of many kinds and plumes. The higher cannot be discerned in their plumes, but in manner of flying and quantitie appeare of divers sorts."—J. L. BAUGHMAN, *Texas Game, Fish and Oyster Commission, Rockport, Texas.*

The name of the continental race of the Golden Weaver Bird, *Ploceella hypoxantha* (Sparrman).[1]—For many years the mainland form of *Ploceella hypoxantha* has masqueraded as *chrysea* of Hume (almost always emended to *chrysaea*), with reference to [*Ploceus*] *chryseus* Hume, *in* Hume and Davison, Stray Feathers, 6: 399, footnote, June, 1878.

A study of this reference shows that the 'description' reads as follows: "*N. B.*—Though I have called this species a *Ploceus*, I quite agree with Mr. Oates that it is a perfectly distinct form, deserving generic separation. The eggs alone suffice to show that it is not a true *Ploceus*. My own belief is that *javanensis* is distinct, and that the Burmese bird requires a name. In our museum it stand [*sic*] as *chryseus*."

Nothing here satisfies the requirements of Article 25*a* of the International Code of Zoological Nomenclature, especially as clarified by Opinion 1 of the International Commission, nor is the fact that Hume clearly intended to name a Burmese population in itself enough to establish the name nomenclatorially (*cf.* Opinion 52, last paragraph). It must then be considered a *nomen nudum*, and since at its next appearances in literature (Bowdler Sharpe, Catalogue of the Birds in the British Museum, 13: 475, 1890; Oates, Fauna of British India, Birds, 2: 180, 1890) it was submerged in the synonymy of *Loxia javanensis* Lesson, 1831 (which is itself a synonym of *Loxia hypoxantha* Sparrman, 1788), *chrysea* has been unavailable since 1890.

Inasmuch as the well-marked continental bird thus finds itself without any name at all, I propose to call it

[1] Published by permission of the Secretary of the Smithsonian Institution.

Ploceella hypoxantha hymenaica, subsp. nov.

Type: Adult male in breeding plumage, U. S. National Museum No. 333049, collected at Nong (*or* Bung) Boraphet, central Siam at lat. 15° 43′ N., long. 100° 14′ E., on June 24, 1932, by Hugh McCormick Smith (original number 5646).

Diagnosis: In breeding plumage separable in the male from *P. h. hypoxantha* (as exemplified by Javanese specimens) by having the feathers of the mantle fringed with a more greenish, less golden, yellow, and by having the upper breast, adjacent to the black throat patch, more strongly suffused with raw sienna; possibly also by greater length of wings and tail.

Remarks: The subspecific name has allusion to the bird's yellow nuptial dress, reminiscent of that worn by Hymen, god of marriage.—H. G. Deignan, *U. S. National Museum, Washington, D. C.*

Variations in the plumage of the English Sparrow.—Recently the writer examined over 1800 skins of the English Sparrow (*Passer domesticus*) while making an analysis of the zoogeographic aspects of their variation in size. Several of these had variations from the normal plumage. Since this species is being used more and more extensively as a laboratory animal, these variations are here recorded for such value as they may have for genetic studies. *All feathers white:* ♀, C. A. S. No. 15387, Calif.; ♀, P. M. Z. No. 10863, Calif.; sex ?, Ch. M. No. 35.209, S. C. (pink eyes); ♀, Ch. M. No. 7643, S. C.; ♀, M. P. M. No. 18059, Wis. *Crown white* (all from Calif.): ♂, M. V. Z. No. 25867; ♀, C. A. S. No. 38758; ♀, M. V. Z. No. 6596; ♀, M. V. Z. No. 24739; ♀, M. V. Z. No. 24781; dates of collection of these five specimens are respectively 1915, 1923, 1908, 1914, 1914. *Entire plumage light gray:* ♀, S. M. No. 15725, Calif. *Entire plumage light tan suffused with orange or yellow:* ♂, U. S. N. M. No. 255224, Md.; sex ?, M. P. M. No. 12104, N. J.; ♀, A. M. N. H. No. 308365, N. Y.; ♀, Cl. M. No. 25888, Ohio; ♂, Ch. M. No. 31.205, S. C. Another sparrow of this latter type was observed by Mrs. E. H. Timbrell in Rutherford, N. J., from May, 1941 to May, 1944. A water-color painting of this bird was supplied for comparison with the study skins. *All feathers of entire plumage suffused nearly to their bases with a copper-reddish color:* ♂, M. C. Z. No. 80916, Mass.; ♂, M. C. Z. No. 80918, Mass.; ♀, M. C. Z. No. 80917, Mass. It occurred to the writer that these sparrows might have obtained their reddish color in the proximity of some mill where they might have come in contact with a dye. Dr. W. M. Tyler who collected the specimens writes that there are no mills near the farming country where they were collected and that no other similarly colored specimens appeared at a later date in that vicinity. In these specimens the males have black feathers in their normal position. Another reddish English Sparrow is recorded as seen alive in Ottawa, Ont., by G. Eifrig (Auk, 27: 53–59, 1910). *Crown completely chestnut:* ♂, L. M. No. 9149, La. *Crown much more suffused with black than normal:* ♂, B. S. No. 261409, Utah. *Feathers of the throat (normally black) are chestnut:* ♂, M. C. Z. No. 4743, Mass. Seventy-nine out of 974 other males have the black feathers of the throat tinged with chestnut. Fourteen specimens contained one white feather such as a primary, a secondary, or a rectrix. Fourteen specimens contained scattered white feathers.

The abbreviations in the foregoing list refer to the following museums and collections: A. M. N. H., American Museum of Natural History; B. S., U. S. Fish and Wildlife Service; C. A. S., Chicago Academy of Science; Ch. M., Charleston Museum; Cl. M., Cleveland Museum; L. M., Louisiana State University Museum; M. C. Z., Museum of Comparative Zoölogy; M. P. M., Milwaukee Public Museum; M. V. Z., Museum of Vertebrate Zoology; P. M. Z., Princeton Museum of Zoology; S. M.,

San Diego Museum of Natural History; U. S. N. M., U. S. National Museum.—JOHN B. CALHOUN, *Dept. Zoology and Entomology, Ohio State University, Columbus, Ohio.*

Unusual feeding habits of certain herons.—Although on many occasions I have seen herons of various species land in water too deep to let them stand, it has always seemed to me that this was accidental. In all cases there has been attendant distress and the bird has made every effort to take flight again as soon as it discovered its predicament. On several occasions, however, I have seen a Ward's Heron (*Ardea herodias wardi*) apparently deliberately dive into the middle of a lake where the water was approximately 20 feet deep. Two of these instances occurred within a few minutes of each other on December 18, 1945. On this date a light rain was falling and visibility was somewhat lowered. I noticed a large bird that at first glance appeared to be an Osprey, flying over the waters of Bivin's Arm, a small lake near Gainesville, Florida. Numerous American Coots were in the vicinity and they dashed madly away at the approach of this bird which was later identified as a Ward's Heron. Suddenly the heron dived headlong into the water where it remained for perhaps 30 seconds. Again taking wing, it circled off over the lake at an altitude of about six or eight feet. By this time I had secured binoculars (18 x 50, Carl Zeiss). The bird flew with its neck partially extended and, as I watched, it again dived into the water and remained there for about the same length of time as before. This time when it took flight there was definitely an object of some kind held in its bill. With its neck partially extended, it flew out of sight around a point of the shore. The lake in which this performance was observed is filled, even in the central portions, with submerged vegetation (*Ceratophyllum* sp.) and in the summer months the surface is nearly covered with floating mats of these plants. During the winter months, however, the vegetation is well submerged and is no closer than 8 to 15 feet from the surface. I do not feel that the behavior can be explained by the hypothesis that the bird was under the impression that it was landing in a spot that would afford footing. Neither the area nor the actions of the bird will support this idea. All actions on the part of the heron point toward a deliberate attempt to secure something in the water. A letter from Mr. E. A. McIlhenny of Avery Island, Louisiana, who has observed herons in his protected rookery for many years, states that he has observed Louisiana Herons (*Florida caerulea*) and Snowy Egrets (*Egretta thula thula*) " . . . swoop down and hover for a moment, darting their heads underwater in order to capture a twig which can be used in building their nest . . ." The Ward's Heron is not known to nest in the Gainesville area in December and I feel that the evidence points toward the assumption that the heron was securing food.

Since the original observation was made I have watched with great care the behavior of what I believe to be one particular Ward's Heron and on several occasions have watched it repeat the same procedure. On February 3, I had occasion to flush this (?) bird from the shore of the lake. In its flight across the water to the opposite shore it dived into the lake five times. Each time it entered the water head-first, thrusting its entire head and neck under water, and remained on the water while it shook its head and rearranged its wings. It appeared quite at ease in the water and held its head and neck in a fashion that suggested the graceful lines of a swan. Three times the wings were folded neatly along the sides of the body and twice they rested partially extended on the surface before the bird took wing again.

Apparently this behavior on the part of the Great Blue Heron (*Ardea h. herodias*) is well recorded (Bent, Bull. U. S. N. M., 135: 110, 1926, and Taverner, The Canadian

Field Naturalist, 36: 59–60, 1922). From these descriptions I would judge that the behavior I observed was an almost exact duplicate.

On an unrecorded fall date of 1941 I observed a somewhat similar occurrence when a group of Snowy Egrets, comprising fifty to sixty individuals, was seen flying in a large circle over the same lake mentioned above. These birds were flying close to the water and it was apparent that they were dipping into the water occasionally. A 20 × spotting telescope was set up on a tripod to observe them. In this instance the herons were not alighting in the water but rather were catching small fish while in flight. The minnows were plainly visible in their bills as each bird left the circling flock to swallow its catch. This feeding circle was maintained for about fifteen minutes, gradually shifting its position over the lake. The birds were apparently circling about schools of small fish.

During the months of July and early August of 1946, I observed flocks composed of Snowy Egrets and the Little Blue Herons practicing this same behavior. All observations were made in the early morning, 5:30 o'clock. Frequently the birds alighted on the submerged mats of *Ceratophyllum* which sank with their weight. The *Ceratophyllum* is well populated with a fresh water shrimp, *Palaeomonetes palludosa* and it is possible that they were feeding on these animals although it is equally possible that they were catching Eastern top minnows, *Gambusia affinis holbrooki*, which abound on the surface in areas where the *Ceratophyllum* offers them protection. The birds apparently preferred to catch their prey while flying into the wind, circling back higher over the water when flying downwind. On mornings when no wind was blowing the feeding seemed to be governed by the sun, the birds feeding on the flight toward the rising sun.

Bivin's Arm is a bird sanctuary, jointly established by the University of Florida and the Florida Audubon Society for the protection of a large White Ibis and heron rookery, which made it impossible to collect specimens to check the stomach contents. —J. C. Dickinson, Jr., *Department of Biology, University of Florida, Gainesville, Florida.*

Unusual behavior of a Cooper's Hawk.—In April, 1946, at Edison, Bucks Co., Pennsylvania, on hearing the characteristic 'alarm' call of Starlings (*Sturnus vulgaris*) I looked about and through a fringe of trees saw a fairly large bird drop to a near-by slope. As I moved to get a clearer view it arose, struggling, with a Starling, and dropped again to a road paralleling a stream. It was an adult male Cooper's Hawk. As I approached slowly for a photograph, the hawk arose with the Starling (which began to struggle and squeal), barely reached the creek and pitched to a low bank about eight feet from the stream. When I walked to a point opposite, the Starling had quieted and I thought the hawk would commence feeding, but it did not. As I turned to bring some companions to the scene I heard the Starling squeal, and on looking back, I saw the hawk drop into the shallow water. The water touched the hawk's belly at that depth and approximately a third of its tail was immersed. After a minute or two the hawk arose, shook itself as it flew to thebank, and commenced feeding.

The only other instance I know of an accipiter 'drowning' its prey is that which John A. Gillespie, operator of a banding station at Glen Olden, Pennsylvania, witnessed during a fall migration; a Sharp-shinned Hawk (*Accipiter velox*) caught an English Sparrow (*Passer domesticus*) and dropped into a small artificial pool near Gillespie's traps. The pool was rather deep but was partially filled with the fallen autumnal foliage so the hawk sank slowly but kept its wings spread, "perhaps to retain its equilibrium" (Gillespie). It did not sink beneath the surface and shortly

arose, flew to a near-by tree and proceeded to devour its prey.—FREDERICK C. SCHMID, *Academy of Natural Sciences, Philadelphia, Pennsylvania.*

Surf Bird in Yukon Territory.—On August 14, 1945, while I was stationed at Whitehorse, Yukon Territory, Canada, with the Army Air Forces, my attention was directed to some "snipe" that were wandering around one of the hangars. On examination I found three of these "snipe" inside the partly closed hangar doors and five on the outside. They were Surf Birds (*Aphriza virgata*), and quite reluctant to take wing. They would occasionally pick some minutiae from the crevices in the concrete. One picked up and swallowed a beetle about three-quarters of an inch long. Later in the afternoon they were observed walking along a retaining wall at head height and allowed one to approach as closely as two feet.

I know of no other records of this bird in the interior. However, I think this is due to lack of continuous observation by interested persons in those parts. It is quite likely that this species nests above timberline in the vicinity of the numerous lakes to the north of Whitehorse.—FREDERICK C. SCHMID, *Academy of Natural Sciences, Philadelphia, Pennsylvania.*

Unusual Cowbird victims.—This year (1946) we have observed two rather rare cases of Cowbird parasitism. The first was called to our attention on May 26. A nest in a brush pile on the mink farm of J. H. Mahoney near Anoka, Minnesota, contained a Brown Thrasher's egg and one of the parasite, while an egg of the owner was about 2 inches outside the nest in the brush. This egg outside the nest recalls Dr. Friedmann's remarks on owners' eggs out of the nest (in the case of Meadowlarks) in his book on the Cowbirds. This nest was presided over by a tailless male Brown Thrasher and a normal female. The owners' egg was substituted for that of the Cowbird, but the Mahoneys reported on June 13 that the nest had been destroyed.

The second case was that of a Horned Lark feeding a young Cowbird well able to fly. This was observed June 20 at the Chicago Municipal Airport where the birds conducted their operations on and near the passenger walk. I was able to get within six feet of them several times, and thus to observe both with ease. I had them in view at least fifteen or twenty minutes.—TILFORD MOORE, *768 Charles Avenue, Saint Paul 4, Minnesota.*

Chimney Swifts bathing.—In the exhaustive and excellent article on the Chimney Swift in Arthur Cleveland Bent's 'Life Histories,' although mention is made of the swifts dipping down over the surface of a pond to feed, no observation of their actually engaging in bathing seems to have been recorded.

In the late afternoon of a hot, sultry day on July 7, 1946, I saw 25 or 30 Chimney Swifts taking repeated baths on the broad, placid surface of Maiden Creek above the Lenhartsville Dam in Berks County, Pennsylvania. A swift would approach the surface in a long, shallow angle, seemingly gliding down on stationary wings, and then resolutely smack the water with the breast and whole under surface of the body.

There can be no doubt that the birds were really bathing and not picking up floating food, for after each dip the bird 'bounced up' and by a vigorous shake freed its plumage, each time sending down several drops of water. Often the same bird, very much in the manner of a ricochetting stone, would take a second dip and occasionally a third, producing ripples by each dip. Some birds would coast down but at the last moment hesitate and sweep up without touching; others apparently struck rather deeply, as they seemed to struggle to get up in the air. While the Chimney Swifts were engaged in their splashing, a good contrast was afforded by a few Barn Swallows that swept and skimmed the surface of the water in the usual manner.

Mr. John T. Nichols tells me that he once watched a similar performance and that he also believes that the swifts were engaged in bathing. No doubt many observers have witnessed such behavior, but as it is not mentioned in Bent's volume, I thought it would be of interest to put it on record.—CHARLES VAURIE, *American Museum of Natural History, New York 24, N. Y.*

Speed of a Great Blue Heron.—On September 14, 1946, while I was driving along Seven Lakes Drive, in Harriman State Park, Bear Mountain, New York, a Great Blue Heron dropped down below the treetops and flew along in front of the car. The bird had difficulty in regaining altitude, and it is possible that full flying speed was not attained in the mile or more covered before the heron cleared the tree tops. The speedometer showed a speed of 19 to 21 miles per hour. A pair of the herons nest in Lake Nawahunta, and there is usually another pair in white plumage around the same lake.—C. H. CURRAN. *New York, N. Y.*

Albino Robins and Red-wing at Stockton, California.—During January and February, 1946, there was an unusually large influx of Robins (*Turdus migratorius*) in Stockton and vicinity. The birds' numbers ran into hundreds and, at times, to thousands in city parks and orchards, and they were everywhere common on lawns and in yards about town.

On January 25, I discovered a partial-albino Robin feeding on the moist ground of Victory Park in Stockton amidst a group of 40 normally colored Robins. The bird's plumage was noticeably different when on the ground and strikingly so in flight. It had a complete white collar around the neck, extending in mottled pattern up the gray nape and cheeks to the top of the head. The crown was coal black. The deep red breast and flanks were splotched with patches of buffy-white and there was one small white spot on the right side of the upper back. The remainder of the back and the tail were the usual gray-black shade. As it fed on the ground, some white coloration was evident in the bird's wings, and when it flew to a near-by tree, the flash of a white stripe in each wing was unmistakable. The pattern of the stripe reminded me of a Sanderling, though this Robin's stripe was slightly wider. The eyes, legs and feet all seemed normally pigmented. Mrs. E. G. Parrott, a fellow observer, and I both agreed that during the 20 minutes in which we watched the bird, its unusual coloration did not seem to affect its acceptance as a member of the feeding group.

Two days later, January 27, Ernest Meyers and I observed another and different partial-albino Robin along the lower Sacramento Road, eight miles north of Stockton. This individual was feeding at the roadside and was so conspicuous that it was noticed easily from the moving car. It had white shoulder patches and white over much of the back. The breast was red with white spots scattered through it; there were white specks on the black head feathers as well. The outer primaries of the right wing were white, but the left wing feathers were normally colored. All other coloration was normal. The bird was by itself.

It seemed unusual to find two partial-albino Robins within three days, when no others were observed all winter. These two were strikingly distinct in pattern from each other. The Victory Park bird came closer to a symmetrical distribution of white, with an identical stripe in each wing and almost uniform coloration elsewhere. The wing pattern of the roadside bird was decidedly unsymmetrical, although its shoulder patches were balanced. Both birds were predominantly different in pigmentation from the albino Robin at Crawfordsville, Indiana, described by Vogel (Auk, 63: 249–250, April, 1946).

Most recent literature indicates that partial albinism involves countless variations

in color distribution. Brooks [Audubon Magazine, 48 (2): 82–91, March–April, 1946] groups partial albinos into three types: (1) those birds having only a few abnormally white feathers; (2) others with a symmetrical design in white on either side of their bodies; (3) still others which present a mottled white and dark appearance.

I observed a Russet-backed Thrush (*Hylocichla ustulata*) which belonged to type 1 in a redwood forest near Crescent City, California, on July 12, 1946. The bird had one white feather in its tail and otherwise normal brown coloration. A female Bicolored Red-wing (*Agelaius phoeniceus californicus*) of type 2 was observed by eight of us from the Stockton Audubon Society along a ditch nine miles out of Stockton on April 7, 1946. The bird had a brilliant white stripe down the fore edge of each wing in perfect symmetry and was otherwise normally colored. She was flitting through the reeds with other females and males of normal coloration and was chased by two males at separate times while we watched.—VERNA R. JOHNSTON, *Dept. of Zoology, Stockton Jr. College, Stockton, California.*

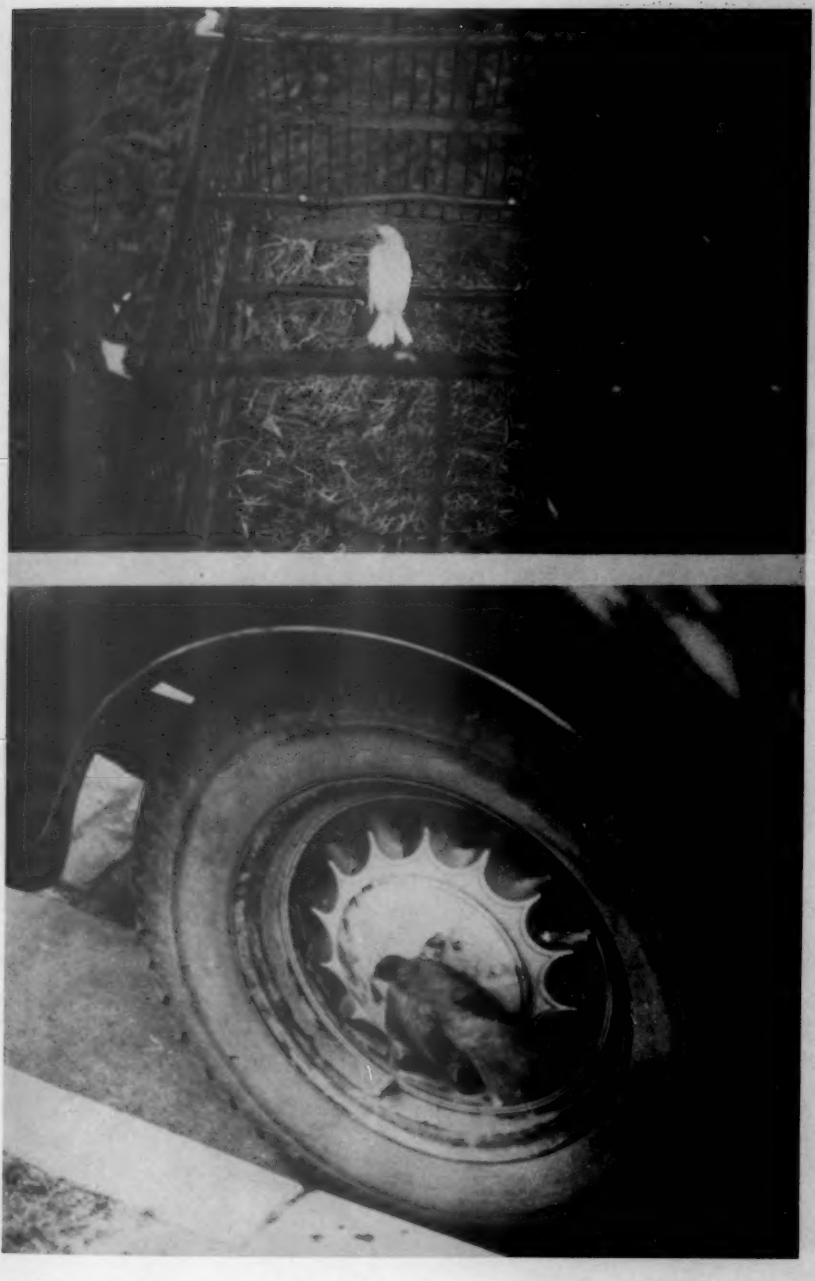
An albino English Sparrow (*Plate 11*, upper *fig.*).—On May 23, 1946, I was called to the home of Mr. Pearl Rice, 234 Pine Ave., Findlay, Ohio, to see and photograph two "white" sparrows. They proved to be two fledgling English Sparrows (*Passer domesticus*). By the time I arrived, one of them had made its escape from the wire canary cage that housed them, but I secured several good photographs of the one remaining. For the two years preceding 1946, Mr. Rice had seen, on many occasions, a pure white sparrow around his barn. On May 23 of this year, 1946, his grandson, playing in the barn, found a nest containing two normally colored young of the English Sparrow and two that very nearly approached pure albinism. The two albinos were placed in a wire cage and the cage set out in the back yard. Both of the parents came to the cage several times to feed them before the one escaped. The male parent was of normal coloration and the hen was pure white. The eyes of the fledgling shown in the photograph were a dark blue. The only other spot of pigment on the bird was a buffy, circular blotch an eighth of an inch in diameter just below the bend of the left wing.—RICHARD STUART PHILLIPS, *834 Liberty St., Findlay, Ohio.*

Unusual nest of Wood Thrush.—A nest of the Wood Thrush (*Hylocichla mustelina*) with two eggs was discovered June 27, 1946, in Reese's Bog on the north shore of Burt Lake, Cheboygan County, Michigan. This nest was constructed almost entirely of at least four species of mosses. The basic construction material was *Calliergon stramineum*. *Calliergon schreberi* and *Hylocomium triquetrum* were added in smaller quantities. The interior of the nest was composed of dried, pressed *Sphagnum* sp., resembling mud.

The nest was placed eight feet up in a twenty-foot white cedar (*Thuja occidentalis*), one foot from the trunk on a horizontal branch. The site was near the center of a dense coniferous forest in which the dominant trees were white cedar and balsam fir (*Abies balsamia*).

Two other pairs were found within 500 yards in different directions from the nest. This record supplements the information of Root (Auk, 59: 113. Jan., 1942), and helps to confirm the supposition that the Wood Thrush is not always confined to deciduous woodlands.—AUSTEN FOX RIGGS, II, *23 Coolidge Hill Road, Cambridge, Massachusetts.*

Robin fighting its reflection in a hub cap (*Plate 11*, lower *fig.*).—The accompanying picture was made in Sullivan, Indiana, during the early part of May, 1939.



(*Upper*) PHILLIPS: ALBINO ENGLISH SPARROW. (*Lower*) MASON: ROBIN FIGHTING ITS REFLECTION IN HUB CAP.

For three consecutive days a Robin was seen fighting its reflection in the hub cap of the car. The 'fights' generally lasted for a period of fifteen to twenty minutes each time. On the day the picture was made the bird had battered itself rather badly until blood was visible on hub cap and on concrete curb also. It was definitely unaware of anyone coming near it. The picture was made from a distance of approximately four feet, (f. 16–1/50) but despite my nearness, the Robin continued to fight the reflection between pauses for rest on the curbstone.—C. R. MASON.

Insect food of the Eastern Sparrow Hawk in Cache Valley, Utah.—During the past twelve years, 68 Eastern Sparrow Hawks, *Falco sparverius sparverius*, have been collected in the northern-Utah portion of Cache Valley. Stomachs of these birds were preserved and examined to determine the kinds and numbers of insects contained.

A total of 888 insects still were recognizable as to order in the stomachs. Eight of the stomachs were collected from April through June; these contained 210 recognizable insects, of which 128 were Orthoptera; 85 field crickets plus 35 other crickets and 8 grasshoppers. Four of 9 Hemiptera present were pentatomids. Of 52 beetles, 8 were June beetles, 2 clickbeetles, 1 long-horned borer and 10 ground beetles, recognized to family. Practically all of the 23 lepidopterous larvae were army cutworms or other cutworms.

During July through September, 640 Orthoptera were recognized, of which 471 were grasshoppers. It was observed that in many of these, only the abdomen was present. The birds apparently discarded the head and wings of many grasshoppers during the process of feeding. In addition, 80 field crickets, 21 sand crickets and 68 crickets of other kinds were recognized. One dragonfly, 1 pentatomid bug, 2 click beetles, 4 dipterous maggots (these probably were parasites from inside grasshoppers that had been eaten), and 1 cranefly also were found. Only one stomach was collected later in the season than September. This contained 12 field crickets and 10 beetles. In addition to insects, 2 spiders, 11 mice, the tail of 1 sagebrush swift (lizard), and 3 parasitic roundworms were present.—G. F. KNOWLTON AND P. E. TELFORD, *Utah State Agricultural College, Logan, Utah.*

Strange behavior of a Broad-winged Hawk.—As the Broad-winged Hawk (*Buteo platypterus platypterus*) is invariably described as a gentle, unsuspicious and unobtrusive species, an instance of its making an entirely unprovoked attack on a human being would certainly warrant a thorough investigation. Arthur Cleveland Bent, in his 'Life Histories of North American Birds of Prey' (Part I), states that he has never found the bird agressive, and he cites only a few cases of attack, on each of which the hawk's nest was threatened.

When, therefore, I was notified by the Berkshire Evening Eagle that late on August 12, 1946, a woman had been attacked in her yard by a hawk, a Broad-winged was about the last species I expected to see. The woman was Mrs. Ida Crandall, aged 65, who had been bending over, clipping grass within a few feet of her front porch, when the hawk struck her on the head. She managed to grab the bird by the feet, and after a violent struggle the hawk lay panting on the ground. A neighbor, Mrs. William Fox, heard Mrs. Crandall's screams but, before she could come to her aid, the bird flew into the elderly woman's face. This time Mrs. Crandall got the bird down and killed it by stepping on its head. The woman was still trembling from excitement when the reporter and photographer reached her home in a wooded section of Lanesboro, about seven miles north of Pittsfield, Massachusetts. Mrs. Crandall had a few minor scratches on the scalp but was not otherwise injured.

I saw Mrs. Crandall early the following morning and identified the hawk as an immature Broad-winged. Mrs. Crandall, who lives alone, does not have chickens or other birds or animals about, which might have attracted the hawk.

When Albert W. Cheevers and his family, of Pittsfield, saw the story and picture in the paper, they declared that they believed the bird was the same one they had released on the 11th, after having made a pet of it for a month. They said the bird had been found badly injured and that the whole family fed and nursed it back to health. The Cheevers live about five air-line miles from Mrs. Crandall's home. Although we could not positively prove it, I do not doubt that the hawk was the same individual Mrs. Crandall killed. Her reactions were those of any self-reliant woman who has spent her life in the country. The case is one of those rare ones in which an extraordinary behavior on the part of a wild bird can be logically explained; the bird was thin and presumably hungry, and being used to people it merely tried to alight on the woman's head, hoping to be fed. Or possibly, because of the thick growth of trees and shrubbery, it misidentified its landing field!—BARTLETT HENDRICKS, *The Berkshire Museum, Pittsfield, Massachusetts.*

Duck Hawks breeding in the business center of Philadelphia, Pennsylvania.—In 1942 (Auk, 59: 176–204, April) James J. Hickey published a comprehensive report on the nesting sites of the Duck Hawk, *Falco peregrinus anatum*, in North America east of the Rocky Mountains. A total of 408 nesting sites were located. Of these, 275 were in the United States, 116 in Canada, and 17 in Labrador and Greenland. Actual nesting on man-made structures was reported by Hickey in only two instances—one on an abandoned stone-bridge pier and the other on a Canadian skyscraper where, in 1940, a pair of falcons brought off two fledglings.

Since Hickey's investigation, another pair of Duck Hawks was found nesting on a hotel building in New York City. Mrs. C. N. Edge, in a report of the Emergency Conservation Committee to the A. O. U. Committee on Bird Protection for the year 1943, states: "In May, 1943, a Duck Hawk's nest was destroyed by the management of a hotel in New York and the young birds were given into the charge of the American Society for the Prevention of Cruelty to Animals. The agent for the Society destroyed the young Duck Hawks. The excuse given by the executive was that his men could not identify the birds" (Auk, 61: 629, 1944). This makes the third record of Duck Hawks actually breeding on man-made structures and only the second record of which I am aware of their breeding on high buildings in cities.

The central business district of Philadelphia has been, for many years, wintering quarters for Duck Hawks. Twenty-eight years ago, January 29, 1918, two Duck Hawks were seen wintering in the center of Philadelphia, and were reported by Delos E. Culver (Auk, 36: 108–109, 1919). These falcons made their headquarters on the City Hall Tower, which is 547 feet high, and used one of the high ledges for perching, 361 feet above ground.

For the past seven years, I have observed Duck Hawks present on the ledges of this tower and in the air around it, during the spring, fall and winter months. Some of the members of the Delaware Valley Ornithological Club, particularly James Bond and Frederick C. Schmid, Jr., of the Academy of Natural Sciences of Philadelphia, have noted these birds on many occasions in the center of Philadelphia. Also, Mrs. Quintin Kramer, who is an excellent and very careful field observer, has seen them in the center of Philadelphia since January, 1939, and has noted them almost continuously about the City Hall Tower not only during the winter but also in the spring months. Within the last few years, she observed a pair together on April 4, 1944, and

May 23 and 29, 1945, and she also saw two together at the Tower on July 21, 1943, which indicated possible breeding in the center of Philadelphia.

I have had an excellent opportunity to observe these birds from my office windows in the Land Title Building, which is 225 yards south of the City Hall Tower. My windows face north and enable me to observe what occurs on the south and east sides of the tower and in the air between the tower and the skyscrapers about 100 yards to the eastward.

The Peregrine Falcons have been attracted to the tower, no doubt, because it offers many advantages to them. It is a square tower, with two ledges on each side, the lower one approximately 300 feet high and the upper one 361 feet high—heights equal to many of the high cliffs these birds are accustomed to using, and giving them the necessary safety. Also, by flying two or three minutes westward from this tower, the falcons can reach Fairmount Park, a natural park containing 3,597 acres of land, much of it wooded and with the Schuylkill River running through it. This park is teeming with bird life. If the falcons fly eastward two or three minutes, they reach the broad Delaware River, where there are hundreds and sometimes thousands of gulls and other water birds, and by crossing the river to New Jersey they find a great abundance of bird life. In addition, there is also a plentiful supply of pigeons always present about the tower and other buildings, which makes food easily available whenever they are unsuccessful in their forays at other places.

During the months of February, March and April, 1946, one or two falcons were observed almost daily on the tower or in the air close to it. On June 3, 1946, on looking out of my office windows I saw four falcons in a small flock, making short, semicircular flights from the tower eastward and back. There were about ten of these flights made by the four falcons within half an hour. These four birds, flying together, gave the impression of possibly two adults giving two young falcons flying exercises. Two days later, June 5, two falcons were in the air a short distance east of the tower, one following the other flying eastward. The next day, June 6, I observed three falcons for one hour, 4:30 to 5:30 P. M., at the tower. One of these birds remained perched on the upper ledge on the east side, while another was on the ledge below. This lower bird did not remain quiet, but walked around to the connecting ledge on the south side, where it proceeded to flap its wings continuously, indicating that it was a young bird exercising its wings. The third bird was also on the lower east-side ledge, but remained only for a few minutes and then flew around to the north side of the tower where it was lost to view.

On the evening of June 6, 1946, at a meeting of the Delaware Valley Ornithological Club, my observations of the falcons at the City Hall Tower were made known to the members, especially the occurrence of the four falcons together on June 3. At this meeting I suggested to the members the possibility of the falcons breeding on the tower or its vicinity. The next day, several of us—Mr. Waldemar H. Fries, Mrs. Quintin Kramer and I—went to the roof of a high office building about 35 yards from the tower, and with 8 x 30 Zeiss binoculars, had a splendid view of one of the adult falcons perched on the upper ledge on the east side. Later the same day, Mr. W. H. Fries, Mr. William W. Lukens, Jr., and Mr. and Mrs. Quintin Kramer spent two hours on this same roof and reported they had observed three falcons at the same time perched on the ledges of the tower. One of these birds was flapping its wings almost continuously and was possibly a young bird.

Three days later, June 10, a Philadelphia newspaper published an account and a photograph of a young falcon on a set-back on the 21st floor of an office building, approximately 100 yards from the City Hall Tower. The following day, Frederick

C. Schmid, Jr., William W. Lukens, Jr., and I paid a visit to the newspaper office, where we were informed that the tenant on the 21st floor of the office building wanted this bird removed from the set-back in front of his office windows. Mr. Love, a pigeon fancier located in the newspaper building, was asked to remove the bird which he proceeded to capture, afterward turning it over to Dr. Robert M. Stabler of the Department of Zoology, University of Pennsylvania, one of the leading falconers in the Philadelphia region, who kindly consented to take care of it.

Dr. Stabler informed me that the falcon, when captured, was about five weeks old and still unable to fly since the wings were not fully developed. Dr. Stabler also stated that it is probable that the young falcon reached the set-back (which is 225 feet above ground and recessed 10 feet), by gliding downward and eastward from a ledge on the tower. The superintendent of the office building informed me that the young falcon had been on the set-back three days before it was removed, and that the parents had been feeding to it pigeons and other food, the remains of which were still on the set-back floor.

Edgar Zander and Edgar Zander, Jr., who are on the 23rd floor of this same office building, told me that they had been observing the falcons on the tower with 6 x 30 binoculars, daily since early spring, 1946, and in the latter part of May and early June, had noted adult falcons capturing pigeons and taking them to the young. Also occasionally, when the young were flying, an adult and a youngster would perch on a narrow off-set from the window sills. The Zanders also photographed the birds perching at their windows.

Although the nest was not definitely seen, I have information which I believe indicates the exact place. I think it is inadvisable to disclose this information at this time in order to protect these birds next year, should they breed here again. However, the facts that four birds were observed at the same time on June 3, three birds were seen together several times by different observers, the young falcons were seen being fed by the parents, and a young bird about five weeks old was captured within 100 yards of the tower where the adults always perched would seem to be adequate and sufficient evidence that a breeding record was established for the Peregrine Falcon in the center of Philadelphia. This makes the third breeding record, so far as I know, of the Peregrine Falcon on a high man-made structure in eastern North America.—HORACE GROSKIN, *Glenn Road, Ardmore, Pa.*

Evidence of polyandry at a Bluebird nest.—In the 1946 nesting season, the eleventh year of the Warner Parks Bluebird Nest-box Project at Nashville, Tennessee, a remarkable situation occurred at Box 17. In the course of the three nesting periods of the season, the box, eggs, or young were defended by two male Eastern Bluebirds (*Sialia sialis sialis*) which appeared to be on the most amicable terms with each other. They made vigorous swoops at my head repeatedly on each of some twenty visits that I made to the box. They came with great speed and some bill snapping, coördinating well with each other, one male in the lead, the other a foot or two directly behind him. At times the female participated in the defense, but her behavior was less pugnacious and she usually retired to a tree to watch, as the males came at me time after time, always swerving just above my head. The three birds never showed any pugnacity toward each other, flying together or perching in close proximity in the same tree.

Although the two males may have been on the territory earlier, I first became aware of this apparent instance of polyandry on April 23, when both males and the female displayed much concern as I handled the three nestlings for banding. Both males wore bands on the left tarsus, indicating they had been banded in some previous

season as nestlings; the female had a band on her right tarsus showing she had been banded as a breeding adult. That day, one male was more persistent in bill snapping and swooping at my head. On the 29th, the males were equally persistent in defense of the young while the female retired to a perch in the large elm near by. Again, on May 4, when the young had left the box and a new nest had been built over the old one, both males flew at me. This behavior continued throughout the season.

Numerous efforts were made to trap the trio for identification. On June 3, I caught one of the males with a net. He had been banded April 17, 1944, one of a brood of five about ten days old, in Box 17, the same box he was now defending. Previously (May 20) I had caught the incubating female and found she had been banded the previous year (1945) also in Box 17. In 1945, she was mated also with a left-banded male that had displayed the same type of pugnacity in nest defense as this one. It seems highly probable that he was the same bird. In that case his history could be summarized thus: He was raised in Box 17 in April, 1944, and he occupied that same area and box in his first and second breeding seasons of 1945 and 1946. His mother was not captured for banding in 1944. The circumstantial evidence in my field records indicate she was not the one trapped in Box 17 in 1945 and 1946. Unfortunately, I was never able to trap the second male to determine his relationship, if any, to the others of the triangle.

In the first nest of 1946, five eggs were laid, from which three young fledged; the two unhatched eggs contained large embryos. The second nest had six eggs, the last of which was laid on May 11. From this set, four young matured and two eggs were found addled. The third nest held the complete clutch of four eggs on June 25. These eggs were still being incubated on July 19, then ten or more days overdue. On my next visit, July 22, they were deserted. All proved to be addled. Although both males were still defending the nest on July 19, no birds were in evidence about the box on subsequent visits.—AMELIA R. LASKEY, *Graybar Lane, Nashville 4, Tennessee.*

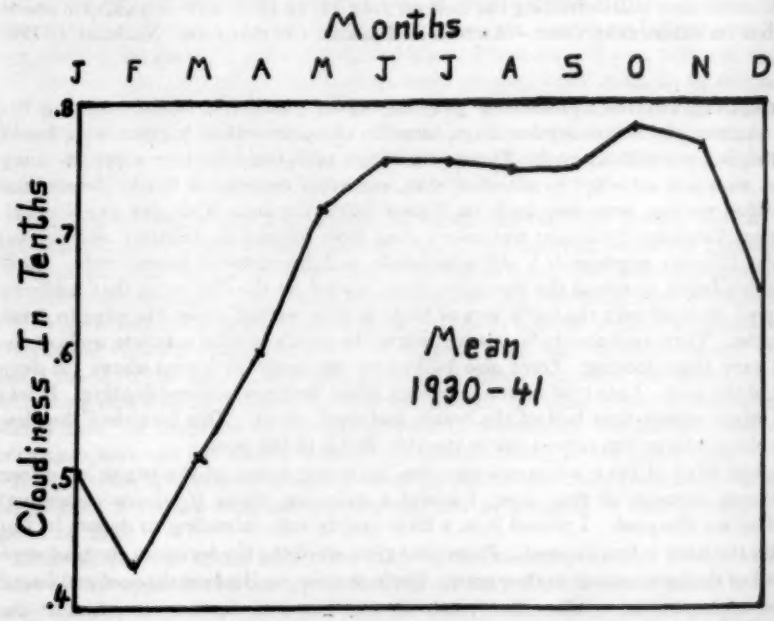
Snapping turtles apparently preying upon passerine birds.—During the late summer of 1943, every few days, bunches of water-soaked feathers were found floating in our small lily pool. There were wings, tails, body feathers which, in many cases, were still attached to pieces of skin, and other remains of birds. Among the identified victims were two each of Yellow-billed Cuckoos (*Coccyzus americanus*), Bronzed Grackles (*Quiscalus versicolor*), Blue Jays (*Cyanocitta cristata*), and several Robins (*Turdus migratorius.*) All were adults or fully matured young birds. Close watching failed to reveal the predator; flour, spread on the flat rocks that bordered the pool, showed only the footprints of birds as they walked about the edge to drink or bathe. They used the shallow water where the gently sloping concrete walls of the pool gave them footing. Some also bathed on the large lily leaves above the deep part of the pool. Late that season, a freshly killed Robin was found floating. It was still intact except that half of the breast had been eaten. This furnished the clew that the predator was some aquatic creature living in the pool.

In late May of 1944, when moisture was becoming scarce at the beginning of our disastrous drought of that year, I found a snapping turtle (*Chelydra serpentina*) heading for the pool. I placed it in a large empty tub, intending to deport it, but within the hour it had escaped. From that time all of the lily leaves in the pool were cut off at the base as soon as they grew. Early in June, we drained the pool and found *two* snapping turtles. After their removal, there were no further casualties at the pool, no feathers floating in it and no depredations on the aquatic plants until 1946.

In early August of that year, the pool became muddy-looking and lost the limpid attractiveness of the early part of the season. Lily leaves, buds, and blossoms were found floating, some being cut away each day from the plants. The remaining leaves became ragged-looking because great pieces were pulled or bitten from the margins. On August 16, chunks of skin with feathers attached, wing and tail plumage, and the body of a Mourning Dove (*Zenaidura macroura carolinensis*) were found floating in the pool. The entire breast and part of the head had been gouged out and consumed. The dove wore an aluminum band which, in the terrific struggle that must have occurred, was pulled over the toes and partially opened as the turtle presumably clamped its jaws over the foot and pulled the bird under water.

The pool was drained without further delay. A six-inch snapping turtle was found on the bottom. It was destroyed and no further depredation upon birds or lilies has occurred since.—AMELIA R. LASKEY, *Graybar Lane, Nashville 4, Tennessee.*

The possible effect of cloud cover on bird migration in Central America.—Experimental evidence in recent years has established the importance of light in northward migration of some temperate-latitude birds. The migration northward from tropical equatorial regions remains open to speculation. Experiments have not yet settled the question whether light itself, acting through the pituitary, is the instigating factor in these temperate-latitude birds (Benoit, 1937; Bissonnette, 1937; Riley, 1941), or whether length of day which increases time of wakefulness is the instigator of northward migration (Rowan, 1929; Wolfson, 1942). Neither of these hypotheses fits migration from tropics since, at the equator, length of day is constant. This has led to theories of an inherent cyclic recovery mechanism of the endocrine system (Bissonnette, 1937; Woodbury, 1941; Blanchard, 1941).



TEXT-FIGURE 1.—Seasonal Variation in Cloudiness at Balboa Heights, C. Z.

The following striking weather phenomena occurring in tropical America is pointed out here, which shows remarkable coincidence and possible bearing on migration of North American birds. In Northern Hemisphere winter, a displacement of the Atlantic high pressure circulation cell takes place southward. This is associated with a movement of the inter-tropical convergence zone of cloudy weather from around 10 degrees N. Lat. south to the equator. Thus in the middle of December the air above 5000 feet in Central America and northern South America changes from moist layers, often heavily laden with altostratus clouds, to a dry condition with relative humidities of 30% or less. Greater stability and dryness eliminate most thunderstorm activity, and the dry season is on. The return of the wet season with its heavy clouds occurs again in the middle of April. Although this effect is much modified by topography, the basic difference in cloud cover is the same over the whole region.

Referring to Text-fig. 1, it is seen that the decrease in cloud cover occurs about a month before birds should leave the winter range for the north. The magnitude of the seasonal change in light is shown by the following figures recorded by Weather Bureau sun duration recorders over a period of years. These figures measure the actual time the sun is out from behind clouds.

HOURS OF SUNSHINE PER DAY

	Canal Zone	*Florida*	*Ohio*
	(20 yrs. data)	(40 yrs. data)	(40 yrs. data)
June—August:	4.8 hrs.	8.0—8.0 hrs.	9.0—10.0 hrs.
December—February	7.9 hrs.	6.0—7.5 hrs.	3.0—4.0 hrs.

This cloud-cover effect is not confined entirely to the tropics. Comparison of the data above shows the extent that cloud-cover in Ohio in winter, due to passage of winter frontal systems, further cuts down on the light of the short days as contrasted with summer when extensive frontal cloud systems are less common.

A further consideration is the quality of light. The clouds persisting in the American tropics until the middle of December are predominantly bluish. These clouds filter the shorter wave-lengths so that the change in December is an increase in intensity of all wave-lengths and a very large increase in the shorter lengths.

Whether these interesting changes have a bearing on bird migration will have to be proved by experiments carried on in the tropics with tropical wintering species. The purpose here is to point out that changes of light intensity correspond well with bird migrations and changes further north.—HOWARD T. ODUM, *Chapel Hill, North Carolina.*

Golden Eagle captures Red-shouldered Hawk.—Among the many thrilling and exciting happenings incident to hawk-watching on Hawk Mountain, are the occasional performances of raptores making passes at, or harrying, one another. More than once I have seen Sparrow Hawks, or Sharp-shinned Hawks, and even Goshawks, pester Golden Eagles in passage over the Sanctuary. Almost always the large birds have exhibited the indifference and serenity becoming to the "lords of the air." An oft-repeated question at the Sanctuary is, "Do the hawks ever kill anything as they pass?" My answer had always been, "No." But on November 1, 1946, I saw an astonishing thing, at an incredible height over the lookout rocks. Lying on my back and scanning the zenith with my 7 x 50 binocular, I picked up a small hawk making frequent passes at a much larger, dark bird. The smaller bird persisted in

annoying its fellow traveller. I switched to an 18-power glass. The dark bird proved to be an adult Golden Eagle. It made a sudden thrust forward, executed an Immelmann turn as effortlessly as a a fly landing on a ceiling, and then, to my amazement, it seized the smaller hawk which seemed to put up a momentary, hopeless struggle. Down came the two birds precipitously, the eagle with set wings and clutching its victim. As the eagle plunged to earth, the wings of the smaller bird were fully outstretched, and I glimpsed the ruddy breast of the Red-shouldered Hawk. The eagle, still clutching its prey, disappeared into the densely wooded flank of the ridge. This immemorial drama of the wilderness took place in a matter of seconds.—MAURICE BROUN, *Hawk Mountain Sanctuary, Route 2, Kempton, Pennsylvania.*

Brant in Vermont.—Last fall (1945), at Charlotte, Vermont, about ten miles south of Burlington, I noticed a large bird in a pasture bordering Lake Champlain. When I was about 150 yards away, the bird walked to the bank of the lake and disappeared over the edge. I ran to the bank, recognized the bird as a Brant, and shot it. I retrieved it by swimming, and may add that Lake Champlain was a little chilly. I did not realize at the time that this was an unusual record until a recent conversation with Mr. Clarence Cottam of the U. S. Fish and Wildlife Service who suggested that the matter might be of interest to the readers of The Auk.—ROBERT S. RUSSELL, *6030 Kenwood Ave., Chicago, Illinois.*

Evening Grosbeaks in New Brunswick in late July.—During the week of July 21, 1946, the writer was fishing with some business associates at Oxbow-on-Tobique, a point twelve miles northeast from the town of Plaster Rock along the Tobique River.

At about four o'clock on the afternoon of July 25, while we were standing on our canoe float, two birds were seen to alight in a near-by dead tree. Through binoculars they were readily identified as a pair of Evening Grosbeaks (*Hesperiphona vespertina*); the bright color of the male bird was easily seen with the naked eye. While the writer is not familiar with New Brunswick ornithology nor with the status of the Evening Grosbeak in that province, he was immediately aware that the mid-summer presence of these birds so far to the east was decidedly unusual, as this species does not regularly breed east of the state of Michigan. The birds in question were studied carefully for about five minutes when they flew off and were not seen again.

As no nest or young were seen, this can hardly be claimed as a breeding record, although the presence of a male and female at this time of year seem to indicate a strong possibility that they were breeding birds.

It was unusual coincidence upon returning home on July 27 to find in the Auk for July an article on the presence of this same species in late June in the Adirondacks. The writer would be very glad indeed to hear of any other summer records of the Evening Grosbeak in the eastern United States or Canada.—R. DUDLEY ROSS, *23 Jefferson Avenue, Arlington, New Jersey.*

Bullock's Oriole in Arkansas.—So far as I am aware, the Bullock's Oriole, *Icterus b. bullockii*, has never been recorded for the state of Arkansas. It would appear, however, that in the vicinity of Little Rock it is not an infrequent visitor.

In checking over some banding data resulting from the operations of Mrs. Rowland Thomas of North Little Rock, my attention was attracted by the records of two orioles (37-220692 and 37-220693) listed as *Icterus bullockii* and banded on September 1, 1938 and September 8, 1938 respectively. Concluding that this was merely an erroneous use of the name, I wrote Mrs. Thomas to that effect and stated that since

bullockii did not occur in that locality "it is obvious that the birds were Baltimore Orioles, and we have changed your schedule accordingly."

This action on the part of the writer was, on purely geographic grounds, entirely defensible. Arkansas has at least three published state lists, by Howell in 1911, by Wheeler in 1925, and by Baerg in 1931,[1] in all of which the only orioles listed as being native to the state are the Orchard Oriole (*Icterus spurius*), and the Baltimore Oriole (*I. galbula*), while the fourth edition of the Check-List indicates that *bullockii* is only casual in migration as far east as eastern Kansas. At the time of my letter to Mrs. Thomas I had, however, overlooked a recently published paper by George Miksch Sutton on some "Oddly Plumaged Orioles from Western Oklahoma"[2] in which the author describes a series of specimens of *Icterus* collected in the spring of 1936 and 1937. The descriptions and colored plate show an almost complete transition from the *galbula* to the *bullockii* types.

In replying to my letter, Mrs. Thomas cited this paper by Dr. Sutton and gave a complete account of her experience with these birds at North Little Rock. Quoting from her letter: "Perhaps I should have released these birds, unbanded. Each of them, as I took her out of the trap, seemed to me enormous (relatively speaking), larger than a Baltimore would be, and I brought each [one] into the house and checked the plumage, as carefully as I could, with the detailed descriptions of the two species in Forbush's Birds of Massachusetts and Other New England States. The decidedly grayish upper shoulders and back, and the pale whitish breast and belly finally decided me in favor of reporting them as Bullock's."

Mrs. Thomas gave further evidence of the occurrence of *bullockii* in her area by reporting in detail an observation made during the last week of April, 1937, when two individuals of this species spent three days in the trees and gardens near her home. Again quoting her report, she stated: "The Orchard Orioles, our abundant species, had but recently returned, and were very jealous of a small cup of water and sugar which I kept for them in the flower garden, and one noon I observed a noisy tilt between a one-year-old male Orchard Oriole and a strange oriole. For the rest of the afternoon I watched that bird and another very like him, finally saw them go to bed in an oak tree close to the house. From 20 yards, with 6 x 30 glasses, I watched them drink from the cup on its low post, and I followed them in all their many posturings as they fed through the oaks. One bird tallied with the description of the adult male Bullock's Oriole, having the bright orange line above the eye, the orange cheeks, and the finger of black down the throat. The second bird was a curious mixture—just traces of orange showed on the sides of the head when he turned sideways, and he had no black on the throat. I assumed him to be an immature male, but could find no mention anywhere of plumage like his. . . . we searched all the books at our command and found no description of our off-colored bird." In commenting on Dr. Sutton's color plate (*loc. cit.*) she stated that her bird was not quite like any of those shown but its head most closely matched fig. 2 "except that he had no black on the throat."

Needless to say, the original identification of the two banded birds as *bullockii* has been restored to the record. In this connection, it should be recalled that a female *bullockii* was taken at Thibodaux, Louisiana, on February 1, 1939, and recorded in

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[1] Howell, Arthur H., Birds of Arkansas, Biol. Surv. Bull. No. 38, Oct. 12, 1911.
Wheeler, H. E., The Birds of Arkansas, a Preliminary Report, State Bureau of Mines, Manufacturers and Agriculture, 1924 [= 1925].
Baerg, W. J., Birds of Arkansas, Bull. No. 258, Agri. Exper. Sta., Univ. of Ark., Jan. 1931.

[2] Auk, 55: 1–6, col. pl., 1938.

The Auk, 57: 257, 1940.—FREDERICK C. LINCOLN, *U. S. Fish and Wildlife Service, Washington, D. C.*

White Pelican in the Chicago region.—A White Pelican in adult plumage was seen on McGinnis Slough, Orland Wildlife Refuge, Cook County, Illinois, on October 2, 1946. The bird was first observed by Mr. Ray Murdy and Mr. Jack Jedlicka who are in charge of duck banding on the Refuge. On October 4 it was observed for more than four hours on the water and in flight by Murdy, Jedlicka and Coursen. On Sunday, October 6, an audience of about fifty local bird students, including several staff members of the Chicago Natural History Museum, studied the pelican at fairly close range. It remained on McGinnis Slough until October 8. This appears to be the fifth record for the Chicago Region.—C. BLAIR COURSEN, *Chicago, Illinois.*

Notes on the Pomarine Jaeger in the Atlantic and Caribbean.—In March, 1945, the writers frequently observed Pomarine Jaegers (*Stercorarius pomarinus*) while enroute from an East Coast seaport to Panamá. In view of the scarcity of published records for this species in the area covered during our voyage, it appears to us that the observations we have made would be of interest.

Near sunset of March 23, two Pomarine Jaegers in light phase joined a group of eight Herring Gulls (*Larus argentatus smithsonianus*) which had been following the ship throughout the afternoon. Our approximate position at the time of this observation was 200 miles southeast of Cape Lookout, North Carolina, at latitude 33 degrees north. The following afternoon, one jaeger was observed about 300 miles off the coast of northern Florida; however the bird did not approach close enough for specific identification.

Mid-afternoon of March 25, 150 miles east of Great Abaco Island in the Bahamas, a single Pomarine Jaeger followed the ship for an hour, appearing directly over the ship on one occasion. The bird was in the light phase, and its blunt-feathered tail and white wing bars were clearly distinguishable.

Early morning of March 26, an individual of description similar to the one seen on the previous day was noted following the ship. Our position at this time was 18 miles east of San Salvador in the Bahamas.

During mid-morning of March 27, about 25 miles east of Cuba, a single Pomarine Jaeger followed the ship for an hour, occasionally alighting in the wake of the ship.

A small group of Pomarine Jaegers, varying in number from five to eight, flew with the ship throughout the morning and early afternoon of March 28. One of the jaegers was in the dark phase. During this period the distance traversed was from 50 to 150 miles to the south of Jamaica. On several occasions we passed single birds of this species resting on the water.

Pomarine Jaegers were last seen March 29 at approximately 13 degrees north latitude and 79 degrees west longitude.—WILLIAM C. STARRETT, *Ames, Iowa,* and KEITH L. DIXON, *La Mesa, California.*

Summering of the Alder Flycatcher in southwestern Virginia.—On June 27, 1946, a small flycatcher was discovered at the edge of an extensive alder thicket less than one mile west of Abingdon, Virginia. As the habitat strongly suggested the possibility of an Alder Flycatcher (*Empidonax t. traillii*), this bird was watched carefully for several minutes. Not only did it fully conform with this species in appearance, size, and habits, but its song supplied the final proof of its identity. In fact, even the call note, a rather loud *pep*, seemed noticeably different from that of other small flycatchers. Within the next few minutes another bird of this species was found frequenting the margin of a small alder thicket.

Dr. James Tanner, of Johnson City, Tennessee, accompanied me to this spot on July 14 in an unsuccessful attempt to collect one of these flycatchers. One such bird was shot as it perched above an alder jungle, but our search for it underneath its perch proved fruitless. Tanner, however, who has had considerable field experience with this species in New York, heard the song and concurred in my identification. On this date, allowing for possible duplication, it appeared that at least six Alder Flycatchers were present, suggesting the presence of immatures out of the nest.

The last field trip made to these alder thickets was on August 8. Positive identification was then impossible, as the flycatchers were silent, but two small flycatchers which apparently belonged to the genus *Empidonax* were still present. No flycatchers have been found in other alder thickets in this region, and Dr. J. J. Murray, of Lexington, Virginia, writes (under date of July 31) that there are "no summer records of the Alder Flycatcher in Virginia." The present occurrence, then, is the first for Virginia and apparently the most southern breeding locality east of the Mississippi River.—HENRY M. STEVENSON, *Department of Zoology, Florida State College for Women, Tallahassee, Florida.*

Nesting of Herring Gull in New Jersey.—On July 14, 1946, when, with J. H. Buckalew, I was banding young Laughing Gulls at Stone Harbor, Cape May County, New Jersey, a Herring Gull in full white plumage was flushed from a nest containing two eggs. Photographs were taken of the nest and eggs. This is probably the first New Jersey record. This is the locality where I found a nest of Gull-billed Tern with two eggs on June 20, 1926.—T. E. MCMULLEN, *Runnemede, N. J.*

Evening Grosbeaks and Purple Finches at Baltimore.—Evening Grosbeaks (*Hesperiphona vespertina*) appeared in the Baltimore region in considerable numbers in the winter of 1945–1946. A flock of about 50 was first seen in central Baltimore on the isolated date of November 15 (Emlen and Davis, Maryland Birdlife, 1: 24, 1945); then on January 1 the birds began appearing in outlying sections of the city and in the surrounding suburbs, and were present in flocks of two to 35 through May 13. At some places the appearances were brief, at others intermittent, and at a few they were continuous for the entire four-month period indicated.

The grosbeaks appeared in the Hamilton, Cedarcroft, Homeland, Roland Park, Dickeyville and Ten Hills sections of Baltimore City, and at Towson, Stevenson, Catonsville and Lansdowne in Baltimore County. Judging by reports from casual observers, the birds were most numerous and widely scattered from the second half of January through March; although it may be that interest in them merely abated after that time, an apparent decline in numbers that began in April at some of the points of prolonged stay suggests that that peak was real. During the second half of February, at least, the birds were present simultaneously at practically all of the places named, including the most widely separated.

The longest observed stay was at Stevenson, Jnauary 1 through May 11; the next longest at Dickeyville, about January 18 through May 13. Elsewhere, there were departures, following appreciable stays, as early as mid-February, and first appearances as late as mid-April. When final departures began in May, males disappeared from some places as much as a week before the last females; at other places the flocks were of mixed sex through final dates as late as May 11.

At most of the places where they appeared—including the two where their stays were longest—the grosbeaks regularly patronized feeding shelves and fed gluttonously on sunflower seed. At half a dozen places, however, they appeared to rely entirely on wild food; buds, and seeds of the catalpa, box elder and an exotic elm were wild foods personally observed or reliably reported.

Unusual numbers of Purple Finches (*Carpodacus purpureus*) were another feature of the 1945–1946 winter in the Baltimore region. These birds were particularly prominent from early February through April, and in some cases seemed to be closely associated with the grosbeaks; at Stevenson both species disappeared simultaneously, during the night of May 11–12.

The 1945–1946 occurrence of Evening Grosbeaks is the third, and much the most extensive, that has been reported for Maryland. The first came in 1922, when small numbers were seen from April 3 to May 12 in the Laurel and Washington, D. C., regions (Cooke, Proc. Biol. Soc. Wash., 42: 45, 1929); the second came in 1942, when two birds were taken at Towson (Kolb and Bond, Auk, 60: 451, 1943). There has already been a western-Maryland report for the winter of 1945–1946, a flock near Hagerstown on December 15 (Middlekauff, Auk, 63: 444, 1946).—HERVEY BRACKBILL, *4608 Springdale Avenue, Baltimore 7, Maryland.*

Summer record of the Marsh Hawk in middle Tennessee.—The discovery of a dead male Marsh Hawk (*Circus cyaneus hudsonius*) about 25 miles south of Nashville near Smyrna, Tennessee, on June 25, 1946, is believed to be the first summer record of this species in middle Tennessee. The harrier had been shot a "few" days before by an unknown person, according to the owner of the property on which it was found. The hawk was well into its molt and was at least a second-year bird. A pair of Marsh Hawks was observed March 24, 1946, within one-fourth of a mile of the locality where the bird was found. None had been recorded after this date although this particular region was visited almost weekly. On July 7, the body of the hawk was re-examined and two primaries which were not too damaged by decomposition were removed for a permanent record. The feathers are now in the collection of Mr. Albert F. Ganier, Nashville, Tenn., Curator of the Tennessee Ornithological Society. —JAMES N. LAYNE, *Chicago, Illinois.*

Anthony's Green Heron nesting in western Oregon.—On July 18, 1946, a nest of the Anthony's Green Heron (*Butorides virescens anthonyi*) was found at the edge of a small lake in Linn Co., just three or four miles east of Corvallis, Oregon, in the heart of the Willamette Valley. The nest contained two downy young, of unequal size, and three eggs. Kodacolor stills and movies were taken of the adults, young, and nest on July 23 by Dr. K. L. Gordon, Head of the Dept. of Zoology at Oregon State College. On that date, none of the three eggs had hatched; as was proved later, they were failures.

The nest was situated about 12 feet over the water of the lake, in an ash tree (*Fraxinus oregona*). The nest itself had a dense shade canopy over it, even though the tree was in direct sunlight every afternoon.

Previous to this, on July 1, 1946, I found adult Green Herons carrying food to a nest (which I could not locate) on a small pond just two miles north of Corvallis, in Benton Co. However, on July 17 I did find this nest which was situated 15 feet over water in a willow (*Salix lasiandra*). This nest also was on the eastern side of the lake, but well shaded and not as exposed as the nest mentioned above. On July 23, I saw one half-grown young perched on a snag on this lake, evidently from the empty nest I found on July 1.

On July 27, 1946, the two young from the nest found July 18 were well feathered, and they left the nest by July 31. The nest was found torn up and with the three eggs floating in the water below where it had been, on August 2. The pond lilies and willows below the nest were thoroughly "white-washed" by the two growing young.

When I visited the lake on August 16, I watched both the young, now well de-

veloped, feeding in shallow water. The leg bands I had put on them were plainly visible when they perched on snags at the edge of the lake.

These two nests constitute the very first actual nesting records of this species in Oregon. At the date of publication of Jewett and Gabrielson's 'Birds of Oregon,' (1940), they stated that the bird was a decided rarity.

On May 25, 1944, a young Green Heron was found in the city of Portland (Jewett, Condor, 47, no. 5: 219, 1944)—the first published proof of the Green Heron breeding in Oregon. My unpublished notes show that on June 28, 1942, I found two half-grown young, barely able to fly and attended by the adult birds, on Horseshoe Lake, near St. Paul, in the northern part of Marion County. It is quite evident that in recent years the Green Heron has become much more common in Oregon. It is surprising that no one has found a nest before this time.—FRED G. EVENDEN, JR., *Dept. of Zoology, Oregon State College, Corvallis, Oregon.*

Ivory Gull in Massachusetts.—During the early afternoon of January 27, 1946, Wallace Bailey of Stoneham, Massachusetts, found an Ivory Gull (*Pagophila alba*) perched on the rooftree of a closed summer home at the edge of the ocean at Bass Rocks, Gloucester, Massachusetts. While he was away looking for some other ornithologist to verify his discovery, the bird was noticed by Arthur Argue and Martin Karplus on the January Field Trip of the Massachusetts Audubon Society. A young man climbed up onto the roof of the house and got quite close to the bird before it flushed and flew off. It then could not be found for several hours, when just at sunset it was finally seen again just offshore on a low outcrop of rock almost awash with the incoming tide. This place was only a quarter of a mile from where it was first seen. However, when it flew to shore, it could not make a perch on a ledge and fell down between two rocks. As I was watching the gull at the time, it was easy to scramble down over the rocks and retrieve the bird, which made no effort to resist capture except to snap its bill a couple of times. There was some ice clinging to its black feet, but otherwise it seemed unharmed.

Because of the weakened condition, it did not seem advisable to leave the bird in its natural habitat, and consequently we took it to my home in Manchester, Massachusetts, about ten miles away. At the suggestion of Wendell Taber, cod liver oil was fed with a medicine dropper. This went down all right without regurgitation. Late that evening the bird seemed considerably revived and could stand on its feet, so a no. 4 band was attached to its leg; but by the next morning the gull was unable to stand and had started regurgitating. Attempts at lifelike photography were rather unsuccessful, and the bird died around 10 A. M. The specimen was given to the Peabody Museum, Salem, Massachusetts, where the skin is now mounted and on display in the permanent collection.

The gull's feathering was immaculate, pure white except for a few minute black speckles about the eyes. The iris seemed black, but in reflected light showed a very dark brown. Contrary to other descriptions, the eyelids were dark. At the base of the bill were pastel shades of slate blue and leaf green, then lemon yellow about the nostrils, and a light rose and yellow at the tip. The legs and feet were completely black. It was interesting to note that the two outer primaries were of equal length and several inches longer than the other primaries. The measurements, made by Frederick Burrill of the Peabody Museum staff, were as follows: Length, 18.67 inches; wing-spread, 43.75; wing (folded), 13.47; tail, 5.77; bill, 1.50; and tarsus, 1.46. He writes that "there were no reproductive organs in the usual position, but, forward of the kidneys were a pair of diminutive bodies which showed testicular structure and an apparent spermatic duct running to each."

The body cavity was found to be infested with parasites; consequently the carcass was sent to Dr. Alexander Wetmore at the National Museum in Washington for identification of the worms, thence forwarded to Dr. E. W. Price of the Zoological Division of Animal Industry, Beltsville, Maryland. He writes: "This bird was examined by Mr. McIntosh and the following parasites noted:

"About two dozen linguatulids, *Reighardia sterna* (Diesing 1864) Ward, 1899, were removed from the body cavity. These were the 'parasitic worms' observed by Mr. Burrill, and may have played a part in the cause of the death of the bird.

"The intestine of the bird harbored several thousand trematodes, representing 5 or 6 species; the most abundant species has been identified as *Cryptocotyle lingua* (Creplin, 1825) Fishoeder, 1903. The gall bladder also harbored several specimens of a trematode. Two species of nematodes were found in and about the stomach."

How this gull came to Gloucester is, of course, a mystery. On the day the bird was discovered, the weather was fair with the temperature at just about the freezing point. There had been a moderate northeast storm six days previously, with gusty westerly winds thereafter. However, a severe storm that developed over the Maritime Provinces of Canada on the 25th and 26th of January may have had something to do with its appearance. Perhaps it was the same bird that W. A. Squires reported at St. John, New Brunswick, on December 22, 1945, for the Christmas Bird Census published in the January-February, 1946, issue of 'The Canadian Field-Naturalist.'—FRANCES L. BURNETT, *Proctor Street, Manchester, Massachusetts.*

American Egret on Mount Desert Island, Maine.—On August 17, 1946, an American Egret was observed on a small artificial pond near Echo Lake, on Mount Desert Island, Maine. This appears to be the first record of this species from the island, where extensive observations have been made by the Ranger-Naturalists at Acadia National Park. The egret was seen almost every day from August 17 to 28, wading in the pond and flying up and sitting in the pine trees along the shore. Kodachrome motion pictures were taken of this white heron fishing, illustrating the snake-like action of its neck. Although the bird was last observed on the island on August 28, an egret was reported two days later from Blue Hill on the mainland.

In 'Birds of Mount Desert Island and Acadia National Park', 1941, by Carroll Tyson and James Bond, the authors give this information on the American Egret:

"Specimen taken on Cranberry Island April 7, 1891 (Everett Smith in Bull. 3 Univ. of Maine, 1897, p. 39); seen at Mud Creek, Marlboro, in August and September, 1938, and in late August, 1940 (Tyson)."—HOWARD H. VOGEL, JR. *Wabash College, Crawfordsville, Indiana.*

Greenland Wheatear in southern Baffin Island.—J. Dewey Soper, in his useful paper on the birdlife of Baffin Island, states that *Oenanthe oenanthe leucorhoa* has never been recorded "anywhere in extreme southern and southwestern Baffin Island" (Auk, 63: 420, 1946). Under the circumstances I can hardly blame him for failing to know that I saw three of the beautiful birds in a loose flock just inland from the Hudson's Bay Company's trading-post buildings at Lake Harbor, southern Baffin Island, on August 5, 1929, while I was *en route* to Southampton Island. The personal letter in which I mentioned these birds to my friend, the late Bayard H. Christy, was published in The Cardinal, 2 (7): 204, January, 1930, while I was in the North; hence I had no chance to correct proof. Through an unfortunate, though quite natural, misreading of my handwriting, the locality stated was Lake *Harka* rather than Lake Harbor. As for the record itself, the following direct quotations from my field notes for August 5 will serve to show how pleased I was to see the birds: "On the way back

to the lake [inland from the post] I saw a family of Pipits—the parents calling in an agitated manner, and several Snow Buntings, the gray juvenals flying about the rocks rather awkwardly. But the chief joy of the day came in seeing my first Wheatears. I saw at least three of them, apparently all in juvenal plumage. The birds were tame; I saw them clearly. They perched on the rocks and snapped at flies on the wing much like a Redstart, with widely spread tail, and a reckless, headlong manner. They were all somewhat mottled brownish above, and it seemed to me that they had a tinge of reddish on the sides of the breast. The tails were decidedly the most noticeable feature, the vivid white patches showing at great distance *in flight*. The call-note was noticeably different from that of the Snow Bunting and Pipit. It sounded like *chŭh* or *tchŭh*. It was quite clear, but not very loud. The birds were not only tame but curious. When I stood still they often flew closer to inspect me the better. I saw no individual in what appeared to be adult plumage. This was a real treat." Two paragraphs farther on I added: "The Wheatears I saw today bobbed their tails much in the manner of Pipits. They had a facial expression similar to that of *Anthus* also."—GEORGE MIKSCH SUTTON, *Museum of Zoology, University of Michigan, Ann Arbor, Michigan.*

A North American record of the Bean Goose.—On April 19, 1946, two men, Steve Likanof and George Rukivishnikoff, from the village on St. Paul Island, were hunting on the near-by lagoon, and killed two out of a flock of three geese. The geese were unknown to them and also to Clarence Olsen, Asst. Superintendent of the Pribilofs, who spent the winter there. Since the bird was not known to anyone on the islands, John Hansen, who had worked with several visiting naturalists, skinned it, treated it with alum, stretched it over a wire frame, spread its wings and hung it up to dry. He did a fine job of skinning and preserving it.

When I arrived in the island on June 17, 1946, the bird was immediately shown to me. It was obviously not a North American goose but was not a species with which I happened to be familiar. The skin was given to me. On board the Brown Bear, after some difficulty I relaxed it sufficiently to fold the wings and shape it so that it could be shipped safely. The skin has now been identified by John Aldrich and proves to be *Anser fabalis sibiricus* (Alpheraky), a new bird for North America. The skin is now in my collection at the Patuxent Research Refuge of the U. S. Fish and Wildlife Service.—IRA N. GABRIELSON, *Wildlife Management Institute, Washington 5, D. C.*

The case of the Yellow Warbler.—At the Ottawa meeting of the American Ornithologists' Union in 1926 I presented a brief informal paper under the above title, calling attention to the possibility that the *Motacilla aestiva* of Gmelin [Syst. Nat., 1 (2): 996, 1789], the basis of our present *Dendroica aestiva*, might be found to apply to the darker-colored northern race of the Yellow Warbler, which had been christened *amnicola* by Batchelder (Proc. New England Zool. Club, 6: 82, 1918). This name was based on the bird of Newfoundland, which I found to be precisely the same as that of the north shore of the Gulf of St. Lawrence and of James Bay. The question arose as to which was the prevailing form at the City of Quebec, which (following the procedure in analogous cases) I took as the restricted type-locality of *aestiva*. There were four breeding specimens from this locality in the collection of the Carnegie Museum, and through the courtesy of the late Gus A. Langelier five more were placed at my disposal. Of these nine specimens, one male and one female were clearly referable to the northern race; the rest of the series was just as clearly referable to the southern race. It appears, therefore, that the latter is the prevailing form in the breeding season in the Quebec region, although the locality is obviously

on the border-line between the respective ranges of the two forms. While a larger series might afford a different result, under present circumstances I think we are justified in continuing to use Gmelin's name *aestiva* for the southern race and Batchelder's name *amnicola* for the northern.—W. E. Clyde Todd, *Carnegie Museum, Pittsburgh, Pennsylvania.*

A new name for *Bonasa umbellus canescens* Todd.—When casting about for a suitable name for the Ruffed Grouse of northern Ontario, described by me in the Auk, 57: 395, 1940, it never occurred to me to consult any Russian works for a possible previous use of the name I chose. Messrs. Friedmann and Aldrich, however, in their monographic review of this species (Condor, 45: 99, 1943), cited a published reference to a *Bonasa canescens* dating back to 1895. As long as my *canescens* was considered the same as *umbelloides* Douglas, as said by Friedmann and Aldrich, it did not seem worth while to rename it, but since Messrs. Snyder and Shortt [Canadian Journal Research, (D) 24: 128–129, 1946] have revived the race to which it had been applied, I propose to rechristen it

Bonasa umbellus obscura, subsp. nov.,

with the same specimen as the type.

I take advantage of this opportunity to add that I do not at all agree with Friedmann and Aldrich's treatment of *monticola* and *medianus*, but further discussion of this matter will have to be postponed.—W. E. Clyde Todd, *Carnegie Museum, Pittsburgh, Pennsylvania.*

Bar-tailed Godwit on Long Island, New York.—On or about November 15' 1946, a specimen of the Bar-tailed Godwit, *Limosa lapponica lapponica* (Linnaeus), in winter plumage, was collected by Mr. John Rose of Center Moriches, Long Island. The locality was on the south side of Moriches Bay, opposite Mastic, Long Island. The specimen was taken to the American Museum of Natural History where, with Dr. R. C. Murphy and Mr. J. T. Nichols, I compared it carefully with a series of European examples. We found that it agrees in every respect with winter examples collected in England. The specimen has been presented to the Museum where it is now catalogued as No. 308,880.

This is the first known occurrence of this bird on Long Island and the third for North America, being the second specimen actually to be taken in this country. The first record, mentioned by Bent in his 'Life Histories of North American Shore Birds,' Part 1 (Bull. U. S. Nat. Mus., 142: 295, 1927), was on Cape Cod, Massachusetts, September 16, 1907. The second record, without a specimen taken, was in New Jersey. It was reported by C. W. Urner (Proc. Linn. Soc. N. Y., 50–51: 56, 1940) as having been seen by him at Absecon, N. J., on July 17, 1937; a separate account by J. K. Potter (Bird-Lore, 39: 393, 1937) says: "Brigantine, N. J., July 18 and August 14, Bar-tailed Godwit (Urner and others)." This indicates that there was probably a single bird in that general region which remained for some time and was seen by different observers. In any case, the present occurrence, it may be repeated, makes the third record and the second specimen for North America.—Carl L. Muller, *New York, N. Y.*

RECENT LITERATURE

Bent's 'Life histories.'[1]—The long-awaited 'trade-edition' of U. S. National Museum Bulletin 107 is now at hand and will make a welcome addition to the bookshelves of those ornithologists who have been unable to secure copies of the original. As is well known, only 2500 copies of the original edition were printed, which were believed to be amply sufficient for future demands. So popular did this and succeeding numbers of the series become that the supply of the first few, particularly that of the present title, soon became exhausted and have long been virtually unobtainable *desiderata* of the first water. The present volume will, therefore, serve to give many bird students access to Mr. Bent's informative discussions of the life histories of the species treated in this opening part.

Of the text itself, no comment is needed here. It was long since reviewed in the pages of The Auk and elsewhere on the appearance of the original edition (1919) and has ably stood the test of time. The present comments, therefore, need concern themselves only with the quality of the new edition.

The first thing a reader familiar with the original will notice is the absence of the colored plates of eggs that were a feature of the first and second (no. 113, 1921) bulletins though not continued in subsequent numbers. The remaining illustrations are, in the main, those of the original edition, apparently from new plates, with some omissions (there were originally 43 half-tone plates) and several new pictures. A photograph taken on Walrus Island, Alaska, originally illustrating the Paroquet Auklet is here placed with the Least Auklet, but since the original explanation of the plates (omitted from the new letterpress) lists both species for the locality photographed, the transfer is justifiable.

The text is in most respects, an extremely close copy of the original. The type-bed is slightly larger and the type slightly larger and clearer, but for the most part the reissue follows the original copy line for line and page for page with minor deviation. Some changes in typography are to be noticed, such as in the headings of the various species and in the figures for the measurements of eggs, presumably for the purpose of eliminating bold-faced lettering. The explanation of the plates has been omitted with consequent change in the pagination of the index which is further altered in composition though not in content. These do not affect the authenticity of the text.

Several alterations have been made, however, that tend to dispute with the publishers' claim of the reprint as "unrevised" (p. [I]). The 'Puffin' of the original edition is emended to 'Atlantic Puffin'; 'Loon' to 'Common Loon'; 'American Eared Grebe' to 'Eared Grebe'; and '*Uria troille troille*' and '*Uria troille californica*' to '*Uria aalge aalge*' and '*Uria aalge californica*,' respectively. '*Aethia christatella*' is an error repeated in the Table of Contents but not in the Index. 'Eared Grebe' and 'Atlantic Puffin' are given in the Table, but the other alterations are not, nor are any of them changed in the Index which follows the original nomenclature. A note by Thomas S. Roberts on the Eared Grebe has been omitted from page 32 of the text but is still indexed as though present.

The nomenclatural alterations are not explained. If they were intended to make the names agree with the 4th edition of the A. O. U. Check-List (published subsequent to the original edition of the Bulletin), there are various others that should have been made at the same time. It is questionable if any should have been made in a reprint of this sort.

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[1] BENT, ARTHUR CLEVELAND. 'Life histories of North American diving birds. Order Pygopodes.' 8vo, XIII + 237, 32 pls., 1946. Dodd, Mead & Company, New York. $5.00.

None of these criticisms seriously affect the value of this edition. Mr. Bent's text (except for the omitted quotation from Roberts) appears to be unaltered and it is that for which the Bulletin and the present edition are valuable. Readers will find the original wealth of first-hand and quoted observation that have made the 'Life Histories' an authoritative source book of information about our native birds.

It is hoped that the present volume will receive a sufficiently favorable reception by the public to encourage the publishers to continue their project of reprinting the remainder of the series.—J. T. ZIMMER.

Birds of North and Middle America.[1]—The present welcome instalment of this invaluable work is, like the preceding part, the work of Dr. Friedmann who has, however, drawn freely from Ridgway's unfinished notes which he has left unchanged where present-day concepts have made this possible. There must of necessity have been many alterations necessary as well as a vast amount of original material added and for the finished volume Dr. Friedmann is entitled to the credit.

This part covers the gallinaceous birds of which four endemic families are recognized in addition to that of the Guinea fowls of which a single member has become established in parts of the area covered by the volume. Extralimital forms of the Phasianidae that have become established here are similarly discussed. The full descriptions of all known plumages, the synoptic keys, and the drawings illustrating various characters in each of the genera, together with the bibliographies, make the book, as in former parts, an authoritative work of reference. The illustrations, like those of Part 9, are distributed in place throughout the text instead of collected at the end of the volume. Bold-faced numerals are not used in the index, as they were in parts 1 to 8 to indicate the leading references to generic and specific headings. This sometimes necessitates looking up from one to a dozen different pages to find the right one. The appearance of the printed pages of the index is thus more uniform but there is some loss in serviceability when there are many references to the same names.

The reviewer feels that there are more subspecies of the Ruffed Grouse given recognition than there should be, but in this he realizes that there is room for difference of opinion. Dr. Friedmann and Dr. Aldrich made an earlier study of this species (Condor, 45: 85–103, 1943) and the present arrangement is in accordance with this previous one with which not all workers on the difficult group have been able to agree.

I believe that an omission has been made in the general discussion of the Phasianidae (pp. 232–234) where no "subgroup" has been provided for the true pheasants, although in the key to the genera of the family there is mention of "PHASIANI" which may be the missing subgroup. Also, the use of the subfamily ending, "INAE," for the lesser group, "GALLINAE," may be misleading. It may be questioned whether the introduced *Phasianus* is entitled to a trinomial in view of its very mixed composition.

Dr. Friedmann has determined the existence of a separable form of the Wild Turkey in western México, from northern Jalisco to Durango, for which he adopts the name *Meleagris gallopavo mexicana* Gould. The reviewer suspected the distinction of this form some time ago as he briefly indicated in a popular publication (Field Mus. Nat. Hist., Zool. Leaflet, no. 6: 6, 1924) without giving any detailed evidence. He is pleased that Dr. Friedmann has independently reached a similar conclusion.

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[1] RIDGWAY, ROBERT, AND FRIEDMANN, HERBERT. 'The Birds of North and Middle America. Part X.' U. S. Nat. Mus. Bull. 50, pt. 9: I–XII, 1–484, figs. 1–28, 1946. Price, $1.25.

The synonymy of the family "Cracidae" produces evidence that the name of the family may have to be changed to Penelopeidae! The oldest recognition of the family as a distinct group appears to have been by Vieillot in 1816 in a reference in which only the genus *Penelope* was mentioned by name. The next usage, by Bonaparte in 1831, called the group "Penelopidae" (which included several other families now kept distinct) and the following by Nitzsch in 1840, also "Penelopidae." Cracidae was not used until 1898 when Gadow appears to have proposed it. Any one of the first three references would fix *Penelope* as the type genus of the family and the correct spelling of the family name to be derived from the generic name is Penelopeidae (*cf.* Opinion 140 of the International Commission of Zoological Nomenclature). Dr. Friedmann has produced the evidence although he did not suggest the problem, with which he may be in disagreement.

In any work of the extent of this bulletin, it is possible for a reviewer to select particular points and present opposing views. The foregoing comments are partly of this nature and are not criticisms so much as differences of opinion. They represent a very small part of the text. A vast quantity of extremely useful data is presented on which future investigations can be based, beginning where Dr. Friedmann has stopped. There is no other source where so much basic material is presented on the groups in question in the region treated. The volume will, therefore, take its rightful place on the bookshelf of the working ornithologist where it is certain to be consulted at frequent intervals.—J. T. Zimmer.

The European Goldfinch in religious art.[1]—Although the present work is not strictly ornithological, it has an ornithological background that warrants its mention here. That the European Goldfinch had an important place in religious art in Europe in past centuries is clearly demonstrated in this careful study of the subject. Friedmann has studied 486 paintings of this nature, in the original or in reproduction, which show this bird occupying a prominent place of symbolic significance. The book is concerned with the analysis of this significance and a discussion of the various methods of presentation by various artists and schools. The origins of the ascribed symbolism, in part shared by other birds, in part restrictive, and underlying beliefs concerning various magic powers believed to be possessed by certain species of birds are discussed in considerable detail and should interest many persons who may not care to delve into the artistic side of the matter.

The illustrations are half-tone reproductions of many of the paintings in question or of parts of them. The volume is adequately documented and indexed and contains a list of the various works of art discussed with their repositories as far as known or references to published reproductions. The work gives evidence of a great deal of careful study and 'overtime' labor and should form a valuable reference work for future students of the subject.—J. T. Zimmer.

Audubon originals.[2]—This attractive little booklet is interesting from several points of view. The New York Historical Society is the fortunate owner of the original Audubon paintings of North American birds and these, as has been recognized, are not always identical in all respects with the published plates of his elephant folio. Backgrounds were sometimes added by the engraver (on direction from Audubon)

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[1] Friedmann, Herbert. 'The symbolic Goldfinch. Its history and significance in European devotional art.' Supperroyal 8vo, pp. XXIX [+ 3] + 254, 79 pls. (157 figs.), The Bollinger Series VII, 1946. Pantheon Books, Inc., N. Y. $7.50.

[2] Shelley, Donald A. Hastings House Americana. 'Audubon birds from the original water colors in the New York Historical Society.' Crown 8vo, pp. 1–40, 24 figs. (16 full p. col.), 1946. Hastings House, N. Y. $1.00.

and, in any case, the technique of hand-coloring copper engravings produced somewhat different effects than those of the original water colors. It is interesting, therefore, to have some of the originals here reproduced by offset lithography with results comparable to the originals. In addition, three of the colored illustrations and one of the uncolored figures are of heretofore unpublished drawings, not in the folio—Black-throated Green Warbler, Robin, Long-billed Marsh Wren, and a hybrid duck, respectively.

Mr. Shelley has selected extracts from Audubon's 'Ornithological Biography' relating to the subjects of the colored illustrations, and added other explanatory notes, including a sketch of the artist's life. Vignettes include, among other things, two portraits of Audubon and his signature and seal. Those interested in Audubon will find in this publication something not available elsewhere.—J. T. Zimmer.

Periodical Literature

Alabaster, B. H. Early singing of juvenile Hedge-Sparrow. Brit. Birds, **39** (11): 344, Nov. 1, 1946.

Altini, Giuseppe. L'attività dell'Osservatorio Ornitologico della Mesola nel quinquennio 1936–1940. Istit. Zool. Univ. Bologna., Ric. Zool. Appl. Caccia, **18**: 1–116, figs. 1–4, 1942.

Altini, Giuseppe. Repertorio degli inanellamenti e delle riprese dell'Osservatorio Ornitologico Ligure negli anni dal 1936 al 1940. Istit. Zool. Univ. Bologna., Ric. Zool. Appl. Caccia, **17**: 1–44, 1942.

Altini, Giuseppe. Uccelli inanellati dall'Osservatorio Ornitologico di Ancona e riprese conosciute nel quinquennio dal 1936 al 1940. Istit. Zool. Univ. Bologna., Ric. Zool. Appl. Caccia, **19**: 1–40, 1943.

Anderson, Anders H. and Anne. Notes on the Cedar Waxwing at Tucson, Arizona. Condor, **48** (6): 279–280, Nov. 29, 1946.

Anonymous. Birds of Iowa in 1843 and now. Aud. Bull., **60**: 11–13, 1 fig., Dec., 1946.

Anonymous. Erythristic eggs of the British Jay. Oologists Rec., **20** (3): 48, Sept., 1946.

Ashby, C. B. Early appearance of Greyhens at Lek and male-type display by female. Brit. Birds, **40** (1): 29–30, Jan. 1, 1947.

Ashton, K. B. Breeding of Black-headed Gulls in Glamorganshire. Brit. Birds, **40** (1): 29, Jan. 1, 1947.

Austin, Oliver L. The status of the Cape Cod terns in 1946. Bull. Mass. Aud. Soc., **30** (8): 245, Nov., 1946.

Bal, C. Tweede Broedsel bij Ransuil, *Asio otus otus* (L.). Ardea, **34** (1–3): 261–262, 1946.

Baldwin, Amy G. Kirtland's Warbler and northern Michigan. Aud. Bull., **60**: 5–8, 1 fig., Dec., 1946.

Ballard, Ralph. Passenger Pigeon recollections. Jack-Pine Warbler, **24** (4): 135–137, 3 figs., Oct., 1946.

Barnes, J. A. G. Movements of Bar-tailed Godwits on Morecambe Bay. Brit. Birds, **39** (12): 379, Dec. 2, 1946.

Barron, Donald H. Observations on the early differentiation of the motor neuroblasts in the spinal cord of the chick. Jour. Comp. Neurol., **85** (2): 149–169, figs. 1–6, pl. 1 (figs. 7–10), Oct., 1946.

Barruel, P. Notes pour servir à l'identification des oiseaux dans la nature (cont.). Bull. Soc. Nation. Acclimatation, **93** (2): 60–79, figs. 31–76, Apr.–June, 1946.

BARTELS, E. A. Morphogenetische Wirkungen des Schilddrüsenhormons auf das Integument von Vogelembryonen. Arch. Entwicklungsmechanik Organismen, **142** (4): 763–816, figs. 1–21, Apr. 25, 1943.

BEHREND, FRED W. Downy Woodpecker feeding on corn-ear worm. Migrant, **17** (3): 46, Sept., 1946.

BELSKY, N. V. "Whole" and "part" growth in the post-embryonic development of pigeon. Comptes Rendus Acad. Sci. URSS, **51** (1): 77–79, Jan. 10, 1946.

BENSON, C. W. A new race of Scrub-Warbler from Southern Rhodesia. Ostrich, **17** (3): 197–199, Sept., 1946.—*Bradypterus* (*Caffrillas*) *barratti priesti* (Vumba highlands, Umtali, Southern Rhodesia), new subspecies.

BENSON, C. W. The genera *Turdus*, *Geokichla*, *Psophocichla*, *Monticola*, and *Cossypha* in Nyasaland. Ostrich, **17** (3): 156–164, Sept., 1946.

BERGMAN, GORAN. Der Steinwalzer *Arenaria i. interpres* (L.) in seiner beziehung zur umwelt. Acta Zool. Fenn., **47**: 3–151, figs. 1–17, 7 pls., maps 1–6, Mar. 13, 1946.

BERRY, JOHN. Strange nesting behaviour of a Whitefronted Gander. Avic. Mag., **52** (5): 184–186, 1 pl., Sept.–Oct., 1946.

BLAIR, H. M. S. The Dusky Redshank (*Tringa erythropus*) in Norway. Part 2. Oologists Rec., **20** (3): 33–38, Sept., 1946.

BRELSFORD, W. V. Ecological aspects of the bird life in the Bangweulu area. Ostrich, **17** (3): 165–171, Sept., 1946.

BROWN, F. J. A Cheshire Starling roost, 1944–5. Jour. Anim. Ecol., **15** (1): 75–81, figs. 1–4, May, 1946.

BULL, P. C. Further record of *Pterodroma leucoptera* from Muriwai. New Zeal. Bird Notes, **2** (2): 29–30, Oct. 1, 1946.

BULL, P. C. Notes on the breeding cycle of the thrush and blackbird in New Zealand. Emu, **46** (3): 198–208, Nov. 19, 1946.

BURNETT, FRANCES L., ET AL. White-winged Gulls (cont.). Bull. Mass. Aud. Soc. **30** (9): 293–297, 1 fig., Dec., 1946.

BURNETT, FRANCES L. White-winged Gulls (cont.). Bull. Mass. Aud. Soc., **30** (10): 335–337, Jan., 1947.

BUSS, IRVEN O. Quarterly progress report 9-R. Wis. Wildl. Res. (mimeogr.), **5** (3): 7–18, Nov., 1946.—Report on pheasants, also effect of DDT on birds.

BUSS, IRVEN O. Wisconsin pheasant populations. Wisc. Conserv. Dept., Pub. **326**, A-46: 3–184, pls. 1–18, figs. 1–14.—Progress report of pheasant investigations conducted from 1936 to 1943.

BYERLY, T. C., AND KNOX, C. W. Date of hatch and day length affect age at first egg. Poultry Sci., **25** (6): 587–592, figs. 1A–4, Nov., 1946.

C., H. L. On the nesting of *Emberiza cioides castaneiceps* Moore. Oologists Rec., **20** (3): 45–48, Sept., 1946.

CAMPBELL, BRUCE. Food of Bullfinch. Brit. Birds, **39** (11): 341, Nov. 1, 1946.

CAMPBELL, BRUCE. Nesting of ducks in Caernarvonshire. Brit. Birds, **40** (1): 21, Jan. 1, 1947.

CAMPBELL, BRUCE. Nesting of Willow-Tit in Glamorgan. Brit. Birds, **39** (11): 341, Nov. 1, 1946.

CAMPBELL, BRUCE. Nest sanitation and egg-shell disposal of Chough. Brit. Birds, **39** (11): 340–341, Nov. 1, 1946.

CAMPBELL, BRUCE. Notes on some Monmouthshire and East Glamorgan birds, 1943–1945. Brit. Birds, **39** (11): 322–325, Nov. 1, 1946.

CAMPBELL, BRUCE. Raven nesting in a rookery. Brit. Birds, **39** (11): 340, Nov. 1, 1946.

CAMPBELL, BRUCE. Varieties of British Robin. Brit. Birds, **39** (12): 375, Dec. 2, 1946.

CAMPBELL, JAMES W. Notes on the food of some British birds. Brit. Birds, **39** (12): 371–373, Dec. 2, 1946.

CARIDROIT, F., AND GARCET, S. La mutation "type Poule" du plumage des Coos: son conditionnement par les hormones femelles et par les hormones males. Comp. Rend. Soc. Biol., **1940** (3–4): 103–105, Feb., 1946.

CARNABY, I. C. A further nesting record of the Banded Stilt. Emu, **46** (2): 156–158, Sept. 2, 1946.

CARR, WILLIAM H. Owl friends. Nat. Hist., **55** (10): 481–486, 7 figs., Dec., 1946.

CATERINI, FRANCESCO. L'Osservatorio ornitologico di Pisa nel quinquennio 1936–1940. Istit. Zool. Univ. Bologna., Ric. Zool. Appl. Caccia, **15**: 1–38, figs. 1–2, 1 map (fold), 1941.

CATERINI, FRANCESCO. Osservazioni ornitiche dalla Maremma livornese (Val di Cornia). Riv. Ital. Orn., **16** (4): 174–176, Oct., 1946.

CHAFFER, NORMAN. Hawk robbing grebe's nest. Emu, **46** (2): 158–159, Sept. 2, 1946.

CHAFFER, NORMAN, AND MILLER, G. The Turquoise Parrot near Sydney. Emu, **46** (3): 161–167, pls. 20–21, Nov. 19, 1946.

CHAPIN, JAMES P. A new Lark from the French Congo. Bull. Brit. Orn. Club, **468**: 6–8, Nov. 7, 1946.—*Mirafra malbranti* (30 km. south of Djambala, French Congo), new species.

CHISHOLM, ALEC H. Nature's linguists. A study of the riddle of vocal mimicry. Revised from Victorian Nat., **63** (2–4), June–Aug., 1946.

CHISHOLM, A. H. Observations and reflections on birds of the Victorian Mallee. Emu, **46** (3): 168–186, pls. 22–24, 1 map, Nov. 19, 1946.

CHISHOLM, A. H. The riddle of the mocking-birds. Part 2. Master mimics (cont.). Victorian Nat., **63** (3): 55–62, pls. 7–8, July, 1946.

CLANCEY, P. A. The racial status of Hedge-Sparrows from Northumberland. Brit. Birds, **39** (12): 376, Dec. 2, 1946.

CLARKE, T. E. S., AND HIGGINBOTHAM, G. H. Stone-Curlew in Cheshire. Brit. Birds, **40** (1): 24, Jan. 1, 1947.

CLEMENT, HERBERT. Albatrosses. Aud. Mag., **48** (6) sect. 1: 340–341, 2 figs., Nov.–Dec., 1946.

COLEMAN, EDITH. Voices of the Frogmouth and his nightjar relations. Victor. Nat., **63** (6): 123–125, 1 fig., Oct. 10, 1946.

COLLARD, J., AND GREVENDAL, L. Etude sur les caractères sexuels des pinsons, *Fringilla coelebs* L. et *Fringilla montifringilla* L. Gerfaut, **36** (2): 89–107, 1946.

CONDER, P. J. Rhythmical calling of Chaffinches on migration. Brit. Birds, **39** (12): 374, Dec. 2, 1946.

CONGREVE, W. M. On the breeding of the Red-breasted Flycatcher (cont.). Oologists' Rec., **20** (4): 55–58, Dec., 1946.

CORNISH, A. V. Gannet feeding on large fish. Brit. Birds, **39** (11): 345, Nov. 1, 1946.

CORNISH, A. V., ET AL. Yellowshank in Devon. Brit. Birds, **39** (11): 346, Nov. 1, 1946.

COWAN, I. MCTAGGART, AND MUNRO, J. A. Birds and mammals of Revelstoke National Park. Canad. Alpine Jour., **29** (2): 237–256, 2 pls., 1946.

COWLES, R. B., AND NORDSTROM, A. A possible avian analogue of the scrotum. Science, **104** (2712): 586–587, Dec. 20, 1946.

CUNNINGHAM, J. M. Methods of Silvereye trapping in New Zealand. **Emu, 46 (3):** 209–214, pls. 25–26, Nov. 19, 1946.

DANFORTH, CHARLES G. Color correlations in North American warblers. **Turtox News, 24** (12): 194–195, Dec., 1946.

DAVIES, FRANCIS, AND FRANCIS, ERIC T. B. The conducting system of the vertebrate heart. Biol. Rev., **21** (4): 173–188, Oct., 1946.

DAVIS, H. H. Ornithological notes. Bristol District, 1945. **Proc. Bristol Nat. Soc., 27** (2): 79–92, July 1, 1946.

DAVIS, H. H. Wild Geese on the Severn—2. Avic. Mag., **52 (5): 187–188, Sept.–**Oct., 1946.

DAVIS, JOHN M. Distributional records from Humboldt County, California. Condor, **48** (6): 282–283, Nov. 29, 1946.

DEIGNAN, H. G. New subspecies of birds from peninsular Siam. **Jour. Wash. Acad.** Sci., **36** (12): 428, Dec. 31, 1946.—*Halcyon concreta peristephes* (Khao Luang); *Pteruthius erythropterus schauenseei* (Khao Luang), new subspecies.

DEIGNAN, H. G. Two new hemipodes from southeastern Asia. **Jour. Wash. Acad.** Sci., **36** (11): 390–391, Nov. 15, 1946.—*Turnix suscitator thai* (Nong (or Bung) Boraphet, central Siam), *T. s. machetes* (Siak River, east-central Sumatra), new subspecies.

DELMEE, E. Moeurs de *Pica pica galliae* (Kleinschmidt). **Gerfaut, 35** (4): 187, 1945.—Extracting larval parasites from the hide of cattle.

DE SCHAUENSEE, RODOLPHE MEYER. A new species of wren from Colombia. Not. Nat., **182**: 1–2, Oct. 9, 1946.—*Thryothorus nicefori* (San Gil, Santander), new species.

DICKINSON, J. C., JR. A census of the nesting birds in the Bivin's Arm Rookery. Florida Nat., **20** (1): 9–10, Oct., 1946.

DRIVER, ERNEST C. Learn from the owl. Aud. Mag., **49** (1): sect. 1: 47–51, 8 figs., Jan.–Feb., 1947.

DUGAND, ARMANDO. Notas ornitológicas colombianas, 3 (cont.). **Caldasia, 4 (18):** 277–280, Oct. 25, 1946.

DUGAND, ARMANDO, AND PHELPS, WILLIAM H. El status geográfico de las aves de Maipures (Colombia). Caldasia, **4** (18): 243–276, 2 maps, Oct. 25, 1946.—Summary in English.

DUPOND, CHARLES. Contribution a l'étude de la faune ornithologique des Iles Philippines et des Indes Orientales Néerlandaises. **Mem. Mus. Roy. Hist. Nat.** Belg., (2) **23**: 1–153, 4 figs., Dec. 31, 1942.

DUPOND, C. La question de la Grive à ailes rousses et de la Grive de Naumann en Belgique. Gerfaut, **35** (4): 117–133, 1945.

DUPOND, C. Quelques questions ornithologiques en discussion (cont.). **Gerfaut,** 35 (4): 172–187, 1945.

DUPOND, C., ET AL. Observations ornithologiques saisonnières et locales. **Gerfaut,** 35 (4): 134–169, 1945.

DUPOND, CH., ET AL. Observations ornithologiques saisonnières et locales. Gerfaut, **36** (2): 41–67, 1946.

DUSE, ANTONIO. Risultati degli inanellamenti dell'Osservatorio Ornitologico del Garda negli anni 1936, 1937, 1938, 1939, 1940. **Istit. Zool. Univ. Bologna., Ric.** Zool. Appl. Caccia, **14**: 1–58 + 2, figs. 1–3, 1941.

EDWARDS, E. O. Notes from Menangle Park. **Emu, 46 (3): 232–234, Nov. 19, 1946.**

EDWARDS, GEORGE: HOSKING, ERIC; AND SMITH, STUART. **Aggressive display of the** Ringed Plover. Brit. Birds, **40** (1): 12–19, pls. 1–8, Jan. 1, 1947.

UNIVERSITY OF MICHIGAN LIBRARIES

EISENMANN, EUGENE, AND POOR, HUSTACE H. Suggested principles for vernacular nomenclature. Wils. Bull., **58** (4): 210–215, Dec., 1946.

ENGLAND, M. D. Unrecorded posture of the Great Tit. Brit. Birds, **39** (11): 341, Nov. 1, 1946.

ERRINGTON, PAUL L. Predation and vertebrate populations. Quart. Rev. Biol., **21** (2): 144–177, June, 1946.

FAVERO, LEANDRO. Un Picchio in domesticità. Riv. Ital. Orn., **16** (4): 178–179, Oct., 1946.

FEATHERSTONHAUGH, DUANE. The Flamingos of Andros. Nat. Hist., **56** (1): 24–30, 7 figs., Jan., 1947.

FISHER, HARVEY I., AND BALDWIN, PAUL H. Notes on the Red-billed *Leiothrix* in Hawaii. Pacif. Sci., **1** (1): 45–61, fig. 1, Jan., 1947.

FLEMING, C. A. Breeding of Red-billed Gull. New Zeal. Bird Notes, **2** (2): 27–29, 1 fig., Oct. 1, 1946.

FLEMING, C. A. Present distribution of N. Z. Robins. New Zeal. Bird Notes, **2** (2): 24–25, Oct. 1, 1946.

FLOYD, J. F. M. The Wild Swans of Erin. Avic. Mag., **52** (5): 189–193, 2 pls., Sept.–Oct., 1946.

FORBUSH, EDWARD HOWE. Over the cliff. Bull. Mass. Aud. Soc., **30** (8): 246–249, 1 fig., Nov., 1946.—From hitherto unpublished manuscript.

FRIANT, MADELEINE. La ceinture scapulaire de l'Autruche. Rev. Zool. Bot. Afr., **39** (2): 202–220, figs. 1–14, Aug. 14, 1946.

FRIANT, MADELEINE. L'évolution morphologique du tarsométatarse des oiseaux adaptés à la course et de l'Autruche (*Struthio*), en particulier. Rev. Zool. Bot. Afr., **39** (2): 221–224, figs. 1–2, Aug. 14, 1946.

GAYLARD, S. E. The Hooded Vulture (*Necrosyrtes monachus*) in captivity. Ostrich, **17** (3): 194–197, 2 figs., Sept., 1946.

GIBB, JOHN. Singing of birds on Malta and Gozo. Brit. Birds, **39** (12): 354–357, Dec. 2, 1946.

GLAUERT, L. The Little Shearwater's year. Emu, **46** (3): 187–192, Nov. 19, 1946.

GLAZENER, W. C. Food habits of wild geese on the Gulf Coast of Texas. Jour. Wildl. Manage., **10** (4): 322–329, fig. 1, Oct., 1946.

GORDON, SETON. Golden Eagle running. Brit. Birds, **39** (11): 344, Nov. 1, 1946.

GOVE, JAMES G. Birds seen and heard on Lopez Island, Washington. Murrelet, **27** (2): 33–34, Aug. 31, 1946.

GRANT, C. H. B., AND MACKWORTH-PRAED, C. W. Notes on eastern African birds. Bull. Brit. Orn. Club, **468**: 10–13, Nov. 7, 1946.

GRAYCE, ROBERT L. A bird island of the Labrador. Bull. Mass. Aud. Soc., **30** (8): 241–244, 3 figs., Nov., 1946.

GREENWOOD, ALAN W., AND BLYTH, J. S. S. Sexual maturity in Brown Leghorns. Poultry Sci., **25** (6): 597–605, fig. 1, Nov., 1946.

GREGORY, LESLIE. "Anting" of Starling. Brit. Birds, **39** (12): 374, Dec. 2, 1946.

GRIFFITH, WALTER. Male Kestrel passing prey to female in the air. Brit. Birds, **39** (12): 376–377, Dec. 2, 1946.

GRISCOM, LUDLOW. An ornithologist looks at the waterfowl problem. Bull. Mass. Aud. Soc., **30** (9): 277–285, 5 figs., Dec. 1946.

GRISCOM, LUDLOW. An ornithologist looks at waterfowl. Aud. Mag., **49** (1) sect. 1: 37–46, 7 figs., 2 maps, Jan.–Feb., 1947.

HAMBURGER, VIKTOR. Isolation of the brachial segments of the spinal cord of the chick embryo by means of tantalum foil blocks. Jour. Exp. Zool., **103** (1): 113–142, figs. 1–3, Oct., 1946.

HARDY, ERIC. A handbook of the birds of Palestine (mimeogr.). Educ. Officer-in-Chief, G. H. Q., Middle East Forces: 1–47, 1 map, July, 1946.

HARWOOD, N. Fieldfares in Derbyshire in June. Brit. Birds, 39 (11): 342–343, Nov. 1, 1946.

HAVERSCHMIDT, FR. Notes on nest-sites of the Oyster-Catcher and the Long-eared Owl as a hole breeder. Brit. Birds, 39 (11): 334–336, pls. 44–46, Nov. 1, 1946.

HAVERSCHMIDT, FR. Observations on the breeding habits of the Little Owl. Ardea, 34 (1–3): 214–246, 1946.

HENS, P. A., AND VAN HEURN, W. C. Over de subspecifieke onderscheiding van der Nederlandschen groene specht, *Picus viridis* subspec.? Limosa, 19 (1–2): 1–15, 1 map, Sept., 1946.—Summary in English.

HINDWOOD, K. A. A proposed 'Handbook of Australian Birds.' Emu, 46 (3): 195–197, 1 fig., Nov. 19, 1946.

HOBSON, W. Variations in the eggs of British birds. Part 1 (cont.). Oologists' Rec., 20 (4): 60–63, Dec., 1946.

HOLSTEIN, VAGN. Rovfuglenes Efteraarstraek over Jaegerspris gennem tolv Aar—fra 1934 til 1945. Dansk Ornith. Foren. Tidsskr., 40 (3): 161–188, Nov., 1946.—Summary in English.

HOOGERWERF, A. Aanteekeningen inzake enkele ondersoorten van *Ninox scutulata*. Limosa, 19 (1–2): 44–47, Sept., 1946.

HOOGERWERF, A. Iets over de verschilpunten tusschen de beide van *Arachnothera robusta* bekende ondersoorten van Java en Sumatra. Limosa, 19 (1–2): 47–52, Sept., 1946.

HOOGERWERF, A. Is *Centropus sinensis eurycercus* Hay van Sumatra, Borneo en omliggende eilanden inderdaad verschillend van de op Java levende *Centropus sinensis bubutus* Horsf.? Limosa, 19 (1–2): 40–44, Sept., 1946.

HOSTIE, P. Moeurs du Loriot jaune *Oriolus o. oriolus* (L.). Gerfaut, 36 (2): 119–120, 1946.

HOTCHKISS, NEIL, AND POUGH, RICHARD H. Effect on forest birds of DDT used for Gypsy Moth control in Pennsylvania. Jour. Wildl. Manage., 10 (3): 202–207, July, 1946.

HUMPHREY, JONES. Marabou Storks at the Kalambo Falls. Ostrich, 17 (3): 190–191, Sept., 1946.

HUMPHREY, PHILIP S. Observations at the nest of a Pileated Woodpecker. Migrant. 17 (3): 43–46, Sept., 1946.

HUNT, O. D. Raven nesting in a heronry. Brit. Birds, 39 (11): 340, Nov. 1, 1946.

HURCOMB, CYRIL. Breeding colony of Black-headed Gulls in Middlesex. Brit. Birds, 40 (1): 28–29, Jan. 1, 1947.

HUTT, F. B. Some hereditary abnormalities of domestic animals. Cornell Veterin., 36 (2): 180–194, figs. 1–6, Apr., 1946.

HUTT, F. B., AND BOZIVICH, HELEN. On the supposed matroclinous inheritance of egg size in the fowl. Poultry Sci., 25 (6): 554–561, Nov., 1946.

HUXLEY, JULIAN S. Species and evolution. Endeavor, 5 (17): 3–12, figs. 1–9, Jan., 1946.

IVOR, H. ROY. Days with Evening Grosbeaks. Nat. Mag., 39 (10): 517–519, 3 figs., Dec., 1946.

JACOBS, JAN. Nidification de la Huppe. Gerfaut, 35 (4): 170–172, 1945.

JACOBS, JAN, AND DIRKX, HENRI. Le Héron pourpré *Ardea p. purpurea* L. nicheur en Belgique. Gerfaut, 35 (4): 113–117, 2 figs., 1945.

JAQUES, FLORENCE PAGE. Nighthawks make pleasant neighbors. Aud. Mag., 48 (6) sect. 1: 330–335, 6 figs., Nov.–Dec., 1946.

UNIVERSITY OF MICHIGAN LIBRARIES

JENKINS, C. F. H. The Lemon-breasted Flycatcher in western Australia. Emu, **46** (3): 231–232, pl. 28, Nov. 19, 1946.

JEROME, C. H. Birds breeding in winter [Transvaal]. Ostrich, **17** (3): 191–193, Sept., 1946.

JEWETT, STANLEY G. The Orange-crowned Warbler in Oregon. Condor, **48** (6): 285, Nov. 29, 1946.

JOHNSON, W. B. Golden Eagle's nest in eastern Washington. Murrelet, **27** (2): 34, Aug. 31, 1946.

JOHNSON-FERGUSON, BRIAN. Green Woodpecker in Dumfriesshire. Brit. Birds, **39** (11): 344, Nov. 1, 1946.

JONES, D. G., AND HUTT, F. B. Multiple alleles affecting feathering in the fowl. Jour. Hered., **37** (7): 197–205, figs. 2–5, July, 1946.

JONES, JACK. Australian distribution of two Pygmy-Geese. Emu, **46** (2): 128–131, pls. 16–17, 1 map, Sept. 2, 1946.

JONES, JACK. Flight identification of Australian *Anatidae*. Emu, **46** (2): 123–128, pls. 12–15, Sept. 2, 1946.

JONES, JACK. White-quilled Pygmy-Goose. Emu, **46** (3): 235, Nov. 19, 1946.

JONES, MYRLE AND MARGARET. The fourth annual Iowa spring bird count. Iowa Bird Life, **16** (3): 50–57, Sept., 1946.

KAKUSHKINA, E. A. The development of the nervous activity and the chemical factors of nervous excitation in chicken's embryo. Bull. Exp. Biol. Med., **22** (2): 21–23, 1946. (In Russian.)

KELSO, LEON. Bioelectronic observations. Biol. Leafl. [privat. pub.], **35**: 1–2, Dec. 27, 1946.

KEMPKES, JAY A. Arctic Three-toed Woodpecker nesting in Washington. Murrelet, **27** (2): 27, 3 figs., Aug. 31, 1946.

KILHAM, LAWRENCE. Birding in England. Bull. Mass. Aud. Soc., **30** (8): 235–240, 2 figs., Nov., 1946.

KIMSEY, J. BRUCE. Reactions of Cliff Swallows to a buteonid hawk. Condor, **48** (6): 281, Nov. 29, 1946.

KLUYVER, H. N. De oppervlakte van het Merel-territorium. Ardea, **34** (1–3): 248–251, 1946.

KLUYVER, H. N. Late broedsels in 1944. Ardea, **34** (1–3): 267, 1946.

KOZLOVA, E. V. On the phylogeny of the Tibetan Sandgrouse. Compt. Rend. (Doklady) Acad. Sci. URSS, **51** (4): 325–327, 1 fig., Feb. 10, 1946.

KRUGER, CHR. Invasion af Silkhaler (*Bombycilla g. garrulus* (L.)) Vinteren 1943–44. Dansk. Ornith. Foren. Tidsskr., **40** (3): 197–200, Nov., 1946.—Summary in English.

LACK, DAVID. The ecology of closely related species with special reference to Cormorant (*Phalacrocorax carbo*) and Shag (*P. aristotelis*). Jour. Anim. Ecol., **14** (1): 12–16, May, 1945.

LASKEY, AMELIA R. Snake depredations at bird nests. Wils. Bull., **58** (4): 217–218, Dec., 1946.

LASKEY, AMELIA R. Some Bewick Wren nesting data. Migrant, **17** (3): 39–43, Sept., 1946.

LASKEY, AMELIA R. Watching a Carolina Wren's nest. Chicago Nat., **9** (3): 59–62, Oct., 1946.

LASKEY, AMELIA R. Wildlife casualties on the highways. Migrant, **17** (3): 48, Sept., 1946.

LAWRENCE, C. C. Indian Turtle-Dove. Emu, **46** (3): 234–235, Nov. 19, 1946.

LEACH, E. P. Recovery of marked birds. Brit. Birds, **39** (12): 365–370, Dec. 2, 1946.

LEBRET, T. Eenige baltsbewegingen van Smient en Slobeend. **Ardea, 34** (1–3): 258–261, 1946.

LECOQ, RAOUL; CHAUCHARD, PAUL; AND MAZOUÉ, HENRIETTE. Modifications chronaxiques des avitaminoses B strictes ou mixtes chez le rat et chez le pigeon. Compt. Rend. Soc. Biol., **1940** (3–4): 80–81, Feb., 1946.

LEOPOLD, A. STARKER. Clark Nutcracker in Nuevo Leon, Mexico. **Condor, 48** (6): 278, Nov. 29, 1946.

LEYDI, R. Alcune osservazioni ornitologiche in Provincia di Aosta. **Riv. Ital. Orn., 16** (4): 176–178, Oct., 1946.

LORD, E. A. R. The Powerful Owl. **Emu, 46** (3): 230–231, Nov. 19, 1946.

LUCAS, ALFRED M. Hematology of blood spots in eggs of White Leghorn chickens. Amer. Jour. Anat., **79** (3): 431–471, figs. 1–52, pls. 1–2, Nov., 1946.

LUMSDEN, W. H. R., AND HADDOW, A. J. The food of the Shag (*Phalacrocorax aristotelis*) in the Clyde Sea area. Jour. Anim. Ecol., **15** (1): 35–42, fig. 1, May, 1946.

MACDONALD, J. D. A new species of Wood Hoopoe from the Sudan. **Bull. Brit. Orn. Club, 468**: 5, Nov. 7, 1946.—*Scoptelus cavei* (west of Boma Hills, south-eastern Sudan), new species.

MACDONALD, J. D. The mechanics of bird flight. **Illus. London News, 209** (5607): 390, 4 figs., Oct. 5, 1946.

MACDOUGALL, F. A. Economical status of cormorants in the Pointe au Baril area. Ontario Dept. Lands & Forests, Tech. Circular (mimeogr.), **134**: 1–5, Sept. 19, 1946.

MACLEOD, J. G. R. *Cryptillas victorini*. Ostrich, **17** (3): 202–203, Sept., 1946.

MAKKINK, G. F. Omgekeerde gierzwaluwentrek. **Ardea, 34** (1–3): 264–267, 1 fig., 1946.

MANSFIELD, GEORGE S. Wintering Mountain Bluebirds on the Santa Barbara coast. Condor, **48** (6): 285, Nov. 29, 1946.

MARTIN, LEALON, JR. Can the Whooping Crane be saved? **Nat. Hist., 55** (9): 426–429, 436–437, 6 figs., Nov., 1946.

MAY, D. J. Display of Hedge-Sparrow. Brit. Birds, **39** (12): 376, Dec. 2, 1946.

MAY, D. J. "Injury-feigning" of Tufted Duck. Brit. Birds, **39** (12): 377, Dec. 2, 1946.

MAY, D. J. Observations on the territory and breeding behaviour of the Willow-Warbler. Brit. Birds, **40** (1): 2–11, Jan. 1, 1947.

MCGILL, A. R. Nesting habits of the Goldfinch. **Emu, 46** (3): 235–236, Nov. 19, 1946.

MCGILL, A. R. Partial albinism. **Emu, 46** (3): 197, Nov. 19, 1946.—In Coot and Yellow-winged Honeyeater.

MCKENZIE, H. R., AND ORUM, P. H. Skuas robbing Red-billed Gulls. **New Zeal. Bird Notes, 2** (2): 23, Oct. 1, 1946.

MERIKALLIO, EINARI. Über regionale Verbreitung und Anzahl der Landvögel in Süd- und Mittelfinnland, besonders in deren östlichen Teilen, im Lichte von quantitativen Untersuchungen. Annal. Zool. Soc. Zool. Bot. Fennicae Vanamo, **12** (1): 1–143, 10 maps, Apr. 27, 1946.

MICHEL, N. Quelques observations sur la distribution des oiseaux dans le nord de la région du Karabogaz. Izvestia Soc. Geogr. U. S. S. R., **73** (2): 275–280, figs. 1–4, 1941.—In Russian.

MICHENER, HAROLD AND JOSEPHINE R. Loss of feathers at times other than the normal molt. Condor, **48** (6): 283–284, Nov. 29, 1946.

UNIVERSITY OF MICHIGAN LIBRARIES

MILLER, LOYE. The Elf Owl moves west. Condor, **48** (6): 284–285, Nov. 29, 1946.

MILLER, W. T. Photographer's fun. Ostrich, **17** (3): 181–187, figs. 1–4, Sept., 1946.—Egrets and Great White Heron.

MISCELLANEOUS. Audubon field notes. Tenth breeding-bird census. Aud. Mag., **48** (6) sect. 2: 131–146, 3 figs., Nov.–Dec., 1946.

MISCELLANEOUS. Exceptional passage of Black Terns in 1946. Brit. Birds, **40** (1): 24–26, Jan. 1, 1947.

MITCHELL, R. T. Effects of DDT spray on eggs and nestlings of birds. Jour. Wildl. Manage., **10** (3): 192–194, July, 1946.

MOLTONI, EDGARDO. Aves. Missione Biol. Sagan-Omo, **7** (1): 119–197, 1 pl. (col.), figs. 1–19, 1943.—*Euplectes zavattarii* (Gondaraba, [Abyssinia]), new species.

MOLTONI, EDGARDO. Giacinto Martorelli (1855–1917). Rivista Sci. Nat. "Natura," **37**: 71–76, 1946.—Biographical sketch and bibliography.

MOLTONI, EDGARDO. Ibrido fra Codirosso (*Phoenicurus phoenicurus phoenicurus* (L.)) e Codirosso spazzacamino (*Phoenicurus ochruros gibraltariensis* (Gm.)). Riv. Ital. Orn., **16** (4): 169–172, figs. 1–2, Oct., 1946.

MOLTONI, EDGARDO. L'etimologia ed il significato dei nomi volgari e scientifici degli uccelli Italiani (concl.). Riv. Ital. Orn., **16** (4): 133–162, Oct., 1946.

MOLTONI, EDGARDO. Notizie ornitologiche di Milano e dintorni (1945–46). Riv. Ital. Orn., **16** (4): 180–181, Oct., 1946.

MOOG, FLORENCE. Alkaline and acid phosphomonoesterase activity in chick embryos. Jour. Cell. Comp. Physiol., **28** (2): 197–208, figs. 1–2, Oct., 1946.

MOOIJ, D. Koekoek, *Cuculus canorus* (L.) en Roodborst, *Erithacus rubecula* (L.). Ardea, **34** (1–3): 263–264, 1946.

MORAN, JAMES V. Birds of Saipan and Tinian. Bull. Mass. Aud. Soc., **30** (8): 261–262, Nov., 1946.—Twelve Marianas Mallard seen.

MORENO, ABELARDO. Notas ornitologicas. Mem. Soc. Cub. Hist. Nat., **18** (2): 185–187, 1 pl., Sept., 1946.

MOSSMAN, H. W. Photographing the Mourning Dove. Pass. Pigeon, **8** (3): 71–76, 4 figs., July, 1946.

MUELLER, C. D., AND HUTT, F. B. The numbers of daughters necessary for progeny tests in the fowl. Poultry Sci., **24** (3): 246–255, figs. 1–3, May, 1946.

MUNRO, S. S., AND KOSIN, IGOR L. Relative potency of certain synthetic estrogens when administered orally to chicks. Amer. Jour. Physiol., **147** (3): 582–590, Nov. 1, 1946.

MURIE, ADOLPH. Observations on the birds of Mount McKinley National Park, Alaska. Condor, **48** (6): 253–261, figs. 56–59, Nov. 29, 1946.

MURIE, ADOLPH. The Merriam Turkey on the San Carlos Indian Reservation. Jour. Wildl. Manage., **10** (4): 329–333, Oct., 1946.

NAUMOV, N. P. Geographical variability of fluctuations in numbers and evolution. Jour. Gen. Biol. Moscow, **6** (1): 37–52, figs. 1–4, 1945.—Summary in English.

NOVRUP, LEO. Stor Dødelighed blandt Sløruglerne (*Tyto alba guttata* (Brehm)) i Vinteren 1944–45. Dansk Ornith. Foren. Tidsskr., **40** (3): 188–196, 1 fig., Nov., 1946.—Summary in English.

OBERHOLSER, HARRY C. Three new North American birds. Jour. Wash. Acad. Sci., **36** (11): 388–389, Nov. 15, 1946.—*Anthus spinoletta geophilus* (False Pass, Unimak Island, Alaska), *Amphispiza nevadensis campicola* (Hamer, Jefferson County, Idaho), *Passerella iliaca zaboria* (Circle, Alaska), new subspecies.

ONSLOW, G. HUGHES. Pied Flycatcher breeding in Ayrshire. Brit. Birds, **39** (11): 342, Nov. 1, 1946.

O'Reilly, R. A., Jr. Northern water birds summering on the Gulf Coast of Texas. Wils. Bull., 58 (4): 216–217, Dec., 1946.

Orr, Robert T. The recovery of a wounded swan. Condor, 48 (6): 280, Nov. 29, 1946.

Osman Hill, W. C. Black Stork in Scotland. Brit. Birds, 39 (11): 344–345, Nov. 1, 1946.

Owen, J. H., and Lack, David. The eggs of the Red-backed Shrike. Part 1. Oologists Rec., 20 (3): 38–43, Sept., 1946.

Owen, J. H., and Lack, David. The eggs of the Red-backed Shrike. Part 2. Oologists' Rec., 20 (4): 49–54, Dec., 1946.

Parkhurst, R., and Lack, David. The clutch-size of the Yellowhammer. Brit. Birds, 39 (12): 358–364, Dec. 2, 1946.

Payne, Fernandus. The cellular picture in the anterior pituitary of normal fowls from embryo to old age. Anat. Rec., 96 (1): 77–91, Sept., 1946.

Pearse, Theed. The nesting of the Red-throated Loon on Vancouver Island, British Columbia. Condor, 48 (6): 262–264, fig. 60, Nov. 29, 1946.

Peet, Max M. The Kenai Song Sparrow in Washington. Condor, 48 (6): 280, Nov. 29, 1946.

Peterson, Roger Tory. Nesting sites of the Parula Warbler in the Potomac Valley. Wils. Bull., 58 (4): 197, pl. 7, Dec., 1946.

Phelps, William H. and William H., Jr. Descripcion de cuatro aves nuevas de los cerros Paraque y Ptari-tepui y notas sobre *Bubulcus ibis*, *Myioborus cardonai* y *Platycichla leucops*. Bol. Soc. Venez. Cienc. Nat., 10 (67): 229–240, 1 pl., 1 map, Oct., 1946.—*Myioborus albifacies* (Cerro Paraque, Amazonas Terr., Venezuela), new species. *Turdus roraimae paraquensis*, *Atlapetes personatus paraquensis* (Cerro Paraque, Amazonas Terr.), *Turdus roraimae ptaritepui* (Cerro Ptari-tepui, Gran Sabana, Bolívar), new subspecies.

Pinto, Oliverio. Algumas adendas à avifauna de Monte Alegre. Pap. Avulsos Dept. Zool. S. Paulo, 6 (12): 135–142, Dec. 12, 1944.

Pinto, Oliverio Mario de Oliveira. Comentarios sôbre as aves descritas na Historia Naturalis Brasiliae de Jorge Marcgrave. Dept. Zool. Sec. Agric., Indust., Comercio São Paulo: 1–61, 1946.

Pinto, Oliverio M. de O. Duas formas novas no género *Xiphocolaptes* Lesson. Pap. Avulsos Dept. Zool. S. Paulo, 5 (15): 135–140, 2 pls., Feb. 25, 1946.—*Xiphocolaptes promeropirhynchus paraensis* (Lago do Batista, south of Rio Amazonas, Brazil), *X. major remoratus* (Faz. Aricá-Mirim, left bank lower Rio Aricá, Brazil), new subspecies.

Pinto, Oliverio. Sobre a sucessão das plumagens em *Tigrisoma lineatum marmoratum* (Vieillot). Pap. Avulsos Dept. Zool. S. Paulo, 7 (2): 45–50, pls. 1–2, Apr. 6, 1946.

Pirnie, Miles D. American Brant in Michigan. Jack-Pine Warbler, 24 (4): 137–138, 1 fig., Oct., 1946.

Piveteau, Jean. Étude sur l'*Aphanapteryx*, oiseau éteint de l'Ile Maurice. Annales Paléontol., 31: 3–9, figs. 1–5, 1944–1945.

Plowers, D. C. H. Additional notes on the birds of Bloemhof district. Ostrich, 17 (3): 131–144, 10 figs., Sept., 1946.

Priolo, Angelo, Cattura di Succiacapre dal collo rosso in Sicilia. Riv. Ital. Orn., 16 (4): 173–174, fig. 1, Oct., 1946.

Provost, Maurice W. Spring waterfowl migration in the Ruthven area of Iowa: comparative data for 1934, 1938, and 1942. Iowa Bird Life, 16 (3): 42–46, Sept., 1946.

UNIVERSITY OF MICHIGAN LIBRARIES

RAINES, R. J. White-winged Black Tern in Nottinghamshire. Brit. Birds, **40** (1): 26–27, Jan. 1, 1947.

REEDER, WILLIAM G. Occurrence of Mastiff Bat remains in a pellet of the Barn Owl. Condor, **48** (6): 282, Nov. 29, 1946.

REYNOLDS, R. A. W. Variations in clutch size and some nesting success data. Brit. Birds, **39** (11): 337–339, Nov. 1, 1946.

RICHDALE, L. E. Pair-formation in penguins (cont.). Emu, **46** (2): 133–156, pls. 18–19, Sept. 2, 1946.

RICHDALE, L. E. Pair-formation in penguins. Part 2. Emu, **46** (3): 215–227, pl. 27, Nov. 19, 1946.

RIPLEY, DILLON. Waterfowl collections in the north-eastern United States. Avic. Mag., **52** (5): 170–173, Sept.–Oct., 1946.

RIVIERE, B. B. Kittiwake nesting in Norfolk. Brit. Birds, **39** (12): 379, Dec. 2, 1946.

ROTHCHILD, IRVING, AND FRAPS, R. M. Induced ovipositions in relation to age of oviducal egg in the domestic hen. Proc. Soc. Exp. Biol. Med., **63** (3): 511–514, Dec., 1946.

RUSCONI, CARLOS. Ave y Reptil Oligocenos de Mendoza. Bol. Paleontol. Buenos Aires, no. **21**: 3 pages, figs. 1–2, May 2, 1946.—*Cunampaia simplex*, new genus and species; Cunampaidae, new family.

RUTTLEDGE, ROBERT F. "Injury-feigning" of Meadow-Pipit. Brit. Birds, **40** (1): 20, Jan. 1, 1947.

RUTTLEDGE, ROBERT F. Roosting habits of the Irish Coal-Tit, with some observations on other habits. Brit. Birds, **39** (11): 326–333, pl. 43, 1 fig., Nov. 1, 1946.

RYVES, B. H. Blackbird's clutch of two eggs. Brit. Birds, **39** (12): 375, Dec. 2, 1946.

SALOMONSEN, FINN. Notes on some goose hybrids. Kungl. Vetensk. Vitterh. Samh. Handl., (B) **3** (10): 1–14, figs. 1–2, Jan. 22, 1946.

SCHMALHAUSEN, I. I. Stabilizing selection and the problem of transference of sexual characters from one sex to the other. Jour. Gen. Biol. Moscow, **6** (6): 363–380, 1945.—Summary in English.

SCHRODER, HUGO H. Caracaras of the Florida prairies. Nat. Hist., **56** (2): 84–85, 3 figs., Feb., 1947.

SCOTT, PETER. Alpine Swift in Hampshire. Brit. Birds, **40** (1): 21, Jan. 1, 1947.

SCOTT, PETER. A waterfowl registry and census. Avic. Mag., **52** (5): 167–170, 1 pl. (col.), Sept.–Oct., 1946.

SEDGWICK, ERIC H. Little Shrike-Thrush 'anting.' Emu, **46** (2): 132, Sept. 2, 1946.

SEDGWICK, ERIC H. Record of the Double-banded Dotterel on the west coast. Emu, **46** (3): 214, Nov. 19, 1946.

SELBY, A. D. Lemon-breasted Flycatcher. Emu, **46** (3): 232, Nov. 19, 1946.

SELBY, A. D. Note on the Narrow-billed Bronze-Cuckoo. Emu, **46** (3): 186, Nov. 19, 1946.

SERVENTY, D. L. Publication dates of some recent names. Emu, **46** (3): 236, Nov. 19, 1946.

SHARLAND, M. S. R. Sooty Shearwater in Tasmania. Emu, **46** (3): 228–229, Nov. 19, 1946.

SIBLEY, CHARLES G. A new flycatcher of the genus *Monarcha* from the Bismarck Archipelago. Condor, **48** (6): 281–282, Nov. 29, 1946.—*Monarcha cinerascens tenchi* (Tench Island, St. Matthias Group), new subspecies.

SIBLEY, CHARLES G., AND DAVIS, JOHN. Real de Arriba, Mexico, as a Deppe locality. Condor, **48** (6): 279, Nov. 29, 1946.

SIMON, PAUL. Observation sur la Mésange à longue queue. **Gerfaut, 36 (1): 33,** 1946.

SKEAD, C. J. Hive indication by the Greater Honeyguide (*Indicator indicator*). Ostrich, **17** (3): 199–201, 1 fig., Sept., 1946.

SKUTCH, ALEXANDER F. The hummingbirds' brook. **Sci. Monthly, 63 (6): 447–**457, Dec., 1946.

SIBLEY, C. L. Fertile *Cyanochen-Alopochen* hybrids. **Avic. Mag., 52 (5): 197,** Sept.–Oct., 1946.

SLIPP, J. W. Some records of the Spotted Owl in Washington state. **Condor, 48** (6): 283, Nov. 29, 1946.

SLOOT, W. J. A. TH., AND KROON, D. B. On the phosphorus compounds in the skeleton and in the soft parts of chicken embryos. **Arch. Néerland. Physiol.** Homme Anim., **24** (2): 239–249, July 22, 1942.

SNYDER, L. L. "Tunnel fliers" and window fatalities. **Condor, 48** (6): 278, Nov. 29, 1946.

SNYDER, L. L., AND SHORTT, T. M. Variation in *Bonasa umbellus* with particular reference to the species in Canada east of the Rockies. **Canad. Jour. Research, (D) 24:** 118–133, fig. 1, Aug., 1946.

SOMMANI, ERNESTO. Arrivo eccezionalmente precoce di Rondoni [*Micropus apus* (L.)] a Roma. Riv. Ital. Orn., **16** (4): 180, Oct., 1946.

SOUTHERN, JOHN. Display flight of Willow-Warbler, **Brit. Birds, 39 (12): 375,** Dec. 2, 1946.

SPINNER, GEORGE P. Improved method for estimating numbers of waterfowl. Jour. Wildl. Manage., **10** (4): 365, pl. 24, Oct., 1946.

SPRUNT, ALEXANDER, JR. King of the Kissimmee. **Aud. Mag., 48 (6) sect. 1: 336–**339, 3 figs., Nov.–Dec., 1946.—Florida Crane.

SPRUNT, ALEXANDER, JR. Population survey of the tern colonies of the Dry Tortugas Fort Jefferson National Monument, 1946. **Florida Nat., 20 (1): 1–8, 1 map,** Oct., 1946.

SPRUNT, ALEXANDER, JR. Winter resorts for birds. **School Nat. League Bull.,** (17) **4:** 4 pages, 4 figs., 2 maps, Dec., 1946.

STAGER, KENNETH E. A Western Tree Sparrow from California. **Condor, 48 (6):** 280–281, Nov. 29, 1946.

STANFORD, J. K. Nest lining of wading birds. **Brit. Birds, 40 (1): 23–24, Jan. 1,** 1947.

STARRETT, WILLIAM C., AND DIXON, KEITH L. The scarcity of the Black-footed Albatross in parts of its known range. Condor, **48** (6): 268–271, fig. 62, Nov. 29, 1946.

STATON, J. The status of the Common Tern in Nottinghamshire. **Brit. Birds, 40** (1): 27–28, Jan. 1, 1947.

STEPHENS, J. L. Buzzards Roost heron rookery. Chat, **10** (5): 84, Nov., 1946.

STEVENSON, JAMES O., AND MEITZEN, LOGAN H. Behavior and food habits of Sennett's White-tailed Hawk in Texas. Wils. Bull., **58** (4): 198–205, figs. 1–3, Dec., 1946.

STOKES, A. F. Stilts nesting at Ardmore. New Zeal. Bird Notes, **2** (2): 26–27, Oct. 1, 1946.

STONER, EMERSON A. Early notes on Iowa owls. **Iowa Bird Life, 16** (4): 62–64, 1 fig., Dec., 1946.

STONER, EMERSON A. Phainopeplas at Atascadero, California. **Condor, 48** (6): 285, Nov. 29, 1946.

UNIVERSITY OF MICHIGAN LIBRARIES

STOPHLET, JOHN J. Crow killed by a Duck Hawk. Wils. Bull., **58** (4): 217, Dec., 1946.

STOTT, KEN, JR. Feeding habits of the White-breasted Wood-swallow. Condor, **48** (6): 278, Nov. 29, 1946.

STOTT, KEN, JR. Land of the Calao. Aud. Mag., **49** (1) sect. 1: 12–17, 4 figs., Jan.–Feb., 1947.

STRINGHAM, EMERSON. Wyoming's Devil's Tower, forests and Tetons. Pacot Pubs.; 1–32, 32 figs., 1947.

SUTTON, GEORGE MIKSCH. Wing-flashing in the Mockingbird. Wils. Bull., **58** (4): 206–209, pl. 8, Dec., 1946.

SYLVESTER, WALTER R., AND LANE, PRESTON W. Trapping wild turkeys on the Kentucky Woodlands Refuge. Jour. Wildl. Manage., **10** (4): 333–342, figs. 1–2, Oct., 1946.

TABER, RICHARD D. The winter birds of Adak, Alaska. Condor, **48** (6): 272–277. fig. 63, Nov. 29, 1946.

TAYLOR, DONALD A. Blackbirds attempting to rear four broods from the same nest. Brit. Birds, **39** (11): 343–344, Nov. 1, 1946.

TAYLOR, J. SNEYD. Notes on the Masked Weaver (*Hyphantornis velatus nigrifrons*). Ostrich, **17** (3): 145–155, 2 figs., Sept., 1946.

TAYLOR, J. SNEYD. Winter records of the White Stork at Graaff-Reinet. Ostrich, **17** (3): 204–205, Sept., 1946.

TAYLOR, LEWIS W. Multiplex combs. Poultry Sci., **25** (6): 610–615, fig. 1, Nov., 1946.

TEBBUTT, C. F., ET AL. Food-washing habit of waders. Brit. Birds, **39** (12): 377–378, Dec. 2, 1946.

TEMPERLEY, GEORGE W., AND BLAIR, H. M. S. Breeding of the Black-necked Grebe in County Durham. Brit. Birds, **40** (1): 21–23, Jan. 1, 1947.

TEN KATE, C. G. B. Jonge roerdomp (*Botaurus stellaris*) als prooi van de bruine kuikendief (*Circus aeruginosus*). Limosa, **19** (1–2): 59–60, Sept., 1946.

TEN KATE, C. G. B. *Larus ichthyaëtus* Pallas, nieuw voor de Nederlandse lijst. Limosa, **19** (1–2): 52–55, Sept., 1946.—Summary in English.

TEN KATE, C. G. B. Volwassen roerdomp (*Botaurus stellaris*) in het broedterrein gegrepen. Limosa, **19** (1–2): 60, Sept., 1946.

TEN KATE, R. Witwangsterns bij Gorkum. Ardea, **34** (1–3): 262–263, 1 fig., 1946.

TERRES, JOHN K. Feathered death in the sky. Coronet, **20** (4): 86–88, Aug., 1946.

TERRES, JOHN K. McAtee, food analyst of the birds. Aud. Mag., **48** (6) sect. 1: 362–368, 2 figs., Nov.–Dec., 1946.

TERRILL, L. McI., ET AL. Report on birds. Prov. Quebec Soc. Protect. Birds Annual Rep.: 7–31, 1945.

TEST, FREDERICK H. Testicular asymmetry in the woodpecker *Colaptes*. Pap. Mich. Acad. Sci., Arts & Letters, **30**: 347–353, figs. 1–2, 1945.

THOM, ALEX. S. Display of Sand-Martin. Brit. Birds, **40** (1): 20–21, Jan. 1, 1947.

THORPE, W. H. The evolutionary significance of habitat selection. Jour. Anim. Ecol., **14** (2): 67–70, Nov., 1945.

THORSON, GUNNAR. Technique and future work in Arctic animal ecology. Meddel. Grønland, **144** (4): 1–40, figs. 1–9, Sept. 4, 1946.

TINBERGEN, L. De Sperwer als roofvijand van zangvogels. Ardea, **34** (1–3): 1–213, 1946.—Summary in English.

TODD, W. E. CLYDE. Critical notes on the woodpeckers. Annals Carneg. Mus., **30**: 297–317, Dec. 16, 1946.—*Centurus aurifrons incanescens* (south of Marathon,

Brewster County, Texas), *Chrysoptilus punctigula rubidipectus* (Islands, Obidos, Brazil), *Veniliornis passerinus saturatus* (Mana, French Guiana), *Picumnus aurifrons purusianus* (Hyutanahan, Rio Purús, Brazil), new subspecies.

TOMKINS, IVAN R. Nesting of the Barn Owl on the lower Savannah River. Oriole, 11 (4): 59–63, fig. 1, Oct., 1946.

TOSCHI, AUGUSTO. Il Mignattino piombato (*Chlidonias hybrida hybrida* Pallas) nel Bolognese. Ricerche Zool. Applic. Caccia, Bologna, 14: 3–14, 9 pls., 1940.—Summaries in German, French, English.

TRAUTMAN, MILTON B. A second Ohio record for the Eared Grebe. Wils. Bull., 58 (4): 216, Dec., 1946.

TRAYLOR, MELVIN, JR. Bird life at Bikini carries on, dismissing atomic bombs with utter disdain. Chicago Nat. Hist. Mus. Bull., 17 (11–12): 4–5, 3 figs., Nov.–Dec., 1946.

TURBOTT, E. G., AND SIBSON, R. B. Petrels cast ashore by August gales, 1946, with special reference to *Pachyptila vittata*. New Zeal. Bird Notes, 2 (2): 19–23, Oct. 1, 1946.

VAN BENEDEN, A. L'accouplement chez *Anthus c. campestris*. Gerfaut, 36 (1): 34, 1946.

VAN BENEDEN, A. La faune hivernale du Drello, de l'Oneux et du bois d'Aulnes en Fagne wallonne. Gerfaut, 36 (1): 29–31, 1946.

VAN DEN AKKER, JOHN B. A record of the Myrtle Warbler for Box Elder County, Utah. Condor, 48 (6): 285, Nov. 29, 1946.

VAN DER HAEGEN, P. Les oiseaux casseurs de coquilles. Gerfaut, 36 (1): 33–34, 1946.

VAN DER HAEGEN, P. Loriots jaunes et Gros-becs casse-noyaux. Gerfaut, 35 (4): 190, 1945.

VAN DER HAEGEN, P. Quelques notes sur le Loriot. Gerfaut, 35 (4): 187–189, 1945.

VAN DER PLAAT, A. Notes on some birds observed in the Orange Free State and records of flight speed. Ostrich, 17 (3): 177–180, Sept., 1946.

VAN HECKE, F. Le radar et ses applications en ornithologie. Gerfaut, 36 (1): 20–27, figs. 1–2, 1946.

VAN MARLE, J. G., AND VOOUS, K. H., JR. The endemic Sparrow Hawks of Celebes. Limosa, 19 (1–2): 15–23, pl. 1 (col.), pl. 2, figs. 1–2, Sept., 1946.

VANNUTELLI, LAMBERTO. Circa fattori che influenzano i colori degli uccelli ed alcuni risultati sperimentali (concl.). Riv. Ital. Orn., 16 (4): 163–168, Oct., 1946.

VAN ROSSEM, A. J. The California Quail of Central Baja California. Condor, 48 (6): 265–267, fig. 61, Nov. 29, 1946.—*Lophortyx californica decolorata* (Bahía Concepción, Baja California, México), new subspecies.

VERHEYEN, R. Essai sur la definition des unités de classification en ornithologie. Gerfaut, 36 (2): 67–89, 1946.

VERHEYEN, R. Aspects et évolution du comportement sexuel chez les oiseaux. Gerfaut, 36 (1): 1–20, 1946.

VERHEYEN, R. Description d'un nouveau picidé de l'Equateur central et analyse du potentiel morphologique des genres *Phloeoceastes* Cabanis, *Megapicus* Malherbe et *Scapaneus* Cabanis et Heine. Bull. Mus. Royal Hist. Nat. Belgique, 17 (17): 1–9, Mar., 1941.—*Phloeoceastes melanoleucos erythrobuccalis* (Canchacoto-Occidente, central Ecuador), new subspecies.

VERHEYEN, R. Etude des formes géographiques de la faune ornithologique belge (cont.). Bull. Mus. Royal Hist. Nat. Belgique, 17 (15): 1–12, Mar., 1941; 17 (33): 1–32, May, 1941; 17 (51): 1–20, Aug., 1941; (concl.) 18 (11): 1–8, Mar., 1942.

VERHEYEN, R. Notes sur la faune ornithologique de l'Afrique centrale (cont.). Bull. Mus. Royal Hist. Nat. Belgique, **15** (61): 1–8, Nov., 1939; **15** (66): 1–7, Dec., 1939; **16** (2): 1–7, Jan., 1940; **17** (16): 1–11, Mar., 1941; **17** (23): 1–18, Apr., 1941.

VERHEYEN, R. Résultats du baguage au nid des oiseaux de Belgique pour les dix premières années (1928–1938). Bull. Mus. Royal Hist. Nat. Belgique, **15** (49): 1–36, figs. 1–6, Sept., 1939.

VERWEY, J. Thijsse. Ardea, **34** (1–3): 270–276, pl. 2, 1946.—Obituary.

VESEY-FITZGERALD, BRIAN. The Sky-Lark. Field, **188** (4883): 98–99, 6 figs., July 27, 1946.

VOLKERS, F., AND DE VRIES, G. Enkele waarnemingen van het Kleinst waterhoen (*Porzana pusilla intermedia*) tijdenshetbroedseizoen 1945 in de Eempolder. Ardea, **34** (1–3): 261, 1946.

VOLKERS, F., AND DE VRIES, G. Veranderingen in plantengroei en vogelstand tijdens en na de inundatie der Eempolders. Ardea, **34** (1–3): 268–270, 1 fig., 1946.

VOOUS, K. H., JR. *Accipiter gentilis buteoides* (Menzbier), nieuw voor de avifauna van Nederland. Ardea, **34** (1–3): 246–248, pl. 1, 1946.

VOOUS, K. H., JR. Kan de Fuut, *Podiceps cristatus* (L.), van de grond opvliegen? Ardea, **34** (1–3): 257–258, 1946.

VORONTZOV, E. M. L'origine et la formation de l'ornithofaune de la zone des forêts mixtes de la partie européenne de l'URSS. Izvestia Soc. Geogr. U. S. S. R., **73** (2): 190–200, 1941.—In Russian.

VRYDAGH, J. M. Mantis eating a bird (*Estrilda astrild occidentalis*). Ostrich, **17** (3): 201–202, 1 fig., Sept., 1946.

WAGNER, HELMUTH O. Observaciones sobre la vida de *Calothorax lucifer*. Anal. Inst. Biol. Mexico, **17** (1–2): 283–299, figs. 1–6, Dec. 5, 1946.

WALLACE, GEORGE J. Seasonal records of Michigan birds—spring. Jack-Pine Warbler, **24** (4): 154–167, Oct., 1946.

WALTER, W. G. Some experiments on the sense of smell in birds studied by the method of conditioned reflexes. Archiv. Néerland. Physiol. Homme et Animaux, **27** (1): 1–72, figs. 1–12, May 21, 1943.

WATSON, J. B. Young birds returning to nest. Brit. Birds, **39** (12): 374–375, Dec. 2, 1946.

WETMORE, ALEXANDER. New birds from Colombia. Smiths. Misc. Coll., **106** (16): 1–14, Dec. 30, 1946.—*Momotus momota spatha* (Nazaret, Guajira), *Grallaria rufula saltuensis* (Sierra de Perijá, Depto. Magdalena), *Cnemarchus erythropygius orinomus* (above Mamancanaca), *Ochthoeca diadema rubellula*, *O. rufi-pectoralis rubicundulus* (Sierra de Perijá, Depto. Magdalena), *Thryophilus leucotis collinus*, *Turdus leucomelas cautor*, *Arremon schlegeli fratruelis* (near Nazaret, Guajira), new subspecies. *Metallura iracunda* (above Airoca, Sierra de Perijá, Depto. Magdalena), *Dubusia carrikeri* (south side Rio Guatapurí, Sierra Nevada de Santa Marta, Depto. Magdalena), new species.

WHEELER, ROY. Spring-time observations at Fishermen's Bend, near Melbourne. Emu, **46** (3): 192–194, Nov. 19, 1946.

WHITE, C. M. N. Notes on Pipits of the *Anthus richardi* group and a new race of waxbill from Northern Rhodesia. Bull. Brit. Orn. Club, **468**: 8–10, Nov. 7, 1946.—*Anthus richardi lwenarum* (Balovale, Northern Rhodesia), *Lagonosticta senegala dilutior* (Balovale), new subspecies.

WHITE, S. R. Notes on the bird life of Australia's heaviest rainfall region. Emu, **46** (2): 81–122, pls. 6–11, 1 map, Sept. 2, 1946.

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WINTERBOTTOM, J. M. The density of Karroo birds. Ostrich, 17 (3): 172–176, Sept., 1946.

WINTLE, D. S. Memories of waterfowl at Walcot. Avic. Mag., 52 (5): 180–183, Sept.–Oct., 1946.

WITTHOFT, JOHN. Bird lore of the Eastern Cherokee. Jour. Wash. Acad. Sci., 36 (11): 372–384, Nov. 15, 1946.

WODZICKI, K. A., AND FLEMING, C. A. Census of Gannets in New Zealand. New Zeal. Bird Notes, 2 (2): 17–18, Oct. 1, 1946.

WOOD, R. M. Notes on the bulbuls of the Isipingo district. Ostrich, 17 (3): 188–189, Sept., 1946.

WOODS, H. E. Large clutch of Magpie's eggs. Brit. Birds, 39 (12): 374, Dec. 2, 1946.

WOODS, H. E. Spotted Flycatcher feeding first brood while incubating second clutch of eggs. Brit. Birds, 39 (11): 342, Nov. 1, 1946.

ZIMMER, JOHN T. A new subspecies of tanager from northeastern Colombia. Jour. Wash. Acad. Sci., 36 (11): 389–390, Nov. 15, 1946.—*Chlorospingus ophthalmicus eminens* (Gramalote, Dept. of Norte de Santander), new subspecies.

NOTES AND NEWS

THE SIXTY-FIFTH ANNUAL MEETING—A CORRECTION

Owing to unforseen circumstances, the dates for this meeting at Toronto have been changed to September 8 to 12, 1947. Open sessions for the reading of papers, therefore, will be September 9, 10, and 11.

The Editor greatly regrets that an article in the January issue (pp. 15–35), entitled 'Variations in the bird population of the north-central states due to climatic and other changes,' by Dr. Edwin Lincoln Moseley, is a virtual duplicate of a paper published a few days earlier by the same author in the Ohio Journal of Science, 46: 308–322, "Nov., 1946" = Jan. 11, 1947. Needless to say it would not have been accepted for The Auk if the Editor had been aware that it had been submitted to, or accepted by, another journal. Sincere apologies are due to other authors whose contributions have been delayed in appearance by this unfortunate circumstance.

AUDUBON FIELD NOTES

The National Audubon Society announces that 'Audubon Field Notes,' formerly published as a supplement to 'Audubon Magazine,' is now being issued as a separate journal with a subscription price of two dollars per year. The projected schedule of issue is as follows (subject to change):

January.....Fall Migration	July.....Spring Migration
March.....Christmas Count	September....Nesting Season
May.....Winter Season	November....Breeding Bird Census

HANDWRITING OF ORNITHOLOGISTS

After organization of a collection of samples of the handwriting of ornithologists, a great many duplicates remain. These are not mere rejects but constitute a valuable

collection in themselves, representing various founders of the A. O. U. and extending in dates back to the 80's. These are offered to any interested institution or individual and I will send them all to one address or divided them among any applicants there may be, say in a month subsequent to the distribution of this issue of The Auk.—W. L. McAtee, *Fish and Wildlife Service, Chicago 54, Illinois.*

Research Request

I am interested in obtaining reprints, copies of unpublished manuscripts and results or observations made in connection with the biological control of mosquitoes. I want to bring this information together in the form of annotated bibliographies.—J. B. Gerberich, *Dept. of Biological Science, Michigan State College, East Lansing, Michigan.*

CORRESPONDENCE

Under-wing Fishing of the Black Heron

Editor of The Auk:—The remarkable under-wing fishing of *Melanophoyx ardesiaca* so excellently described and illustrated by Capt. Delacour in The Auk (63: 441–442, pl. 11, July, 1946) may have a significance which is not suggested in the note. It is well known that some fish (*e. g.*, the black bass) congregate in shadows and avoid sunlit water. Possibly the Black Heron is utilizing this habit in some fish of the region. Would that we knew whether such a habit is instinctive (inherited), discovered *de novo* by each individual, or learned imitatively!—Charles H. Blake, *Massachusetts Institute of Technology, Cambridge, Massachusetts.*

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OBITUARIES

THOMAS GILBERT PEARSON, a Member of the American Ornithologists' Union, died suddenly in New York, New York, September 3, 1943, in his seventieth year. He was born in Tuscola, Illinois, November 10, 1873, the son of Thomas Barnard and Mary (Eliott) Pearson. He graduated from Guilford College, North Carolina, in 1897, from the University of North Carolina in 1899, and later, in 1921, received the degree of LL.D. from his alma mater. The first five years after graduation were spent in teaching as Professor of Biology in Guilford College, 1897–1899, and in the State Normal and Industrial College for Women 1899–1904. In 1902, he married Elsie Weatherly who, with a daughter, Mrs. C. T. Jackson, and two sons, T. Gilbert and William, survive him.

In 1903, the legislature of North Carolina enacted a law for the protection of birds and placed the enforcement of the act in the hands of the Audubon Society of North Carolina whose secretary was given the powers of a State Game Commissioner. Pearson was appointed Secretary and entered upon his life work as a wildlife conservationist. For the next forty years his career reads like a romance. In 1910, he became Secretary and Executive Officer of the National Association of Audubon Societies and served as its President from 1920 to 1935. In 1922, he founded the International Committee for Bird Preservation which, prior to World War II, extended its activities to 30 countries. As Chairman of the Pan American section of the Committee, he visited most of the countries of Latin America, from México to Argentina.

Pearson was elected an Associate of the Union in 1891 and a Member in 1902. He attended the annual meetings regularly and usually contributed to the programs. He was an effective speaker and, with his wealth of experience in the field and his fund of anecdotes, he had unusual ability to hold the close attention of his audience. His first book, 'Stories of Bird Life,' appeared in 1901, 'Bird Studies' in 1917, and his autobiography, 'Adventures in Bird Protection,' in 1937. He was senior author of 'The Birds of North Carolina,' 1919 and 1942, co-editor of the 'Book of Birds,' 1937, and Editor-in-Chief of 'Birds of America' in three volumes, 1907. He prepared the Memorial of Edward Howe Forbush which appeared in 'The Auk' in 1930 and contributed notes, comments, and editorials to 'Bird Lore' over a period of years. These contributions, not the least important of his publications, form a record of an outstanding chapter in the history of wildlife protection in America.—T. S. PALMER.

SAMUEL FREDERICK RATHBUN, a Member of the American Ornithologists' Union, died in Seattle, Washington, July 6, 1946, at the advanced age of 88. He was born in 1858, near Newburgh-on-the-Hudson, New York. Six or seven years later, the family moved to Auburn where Rathbun spent the next twenty years and where he did his early collecting. In his early twenties, he joined the Society of American Taxidermists, sponsored by Henry L. Ward's Natural History Establishment in Rochester, where he met W. T. Hornaday, F. A. Lucas, and other zoologists. In 1890, he moved to Seattle where he obtained employment in a bank and "settled down to grow up with the country." The next year, he made a trip east where he married Sue Wilkinson. The couple had just celebrated their Golden Wedding when Mrs. Rathbun died, and he moved to the Arctic Club where he later resided. By profession a banker, he served from 1900 to 1906 as City Treasurer and later became associated with the Seattle First National Bank.

For eight years he was a member of the Advisory Committee, appointed under the Federal Migratory Bird Treaty Act, and in 1925 was appointed State Supervisor of

Game and Game Fish, an office which he administered with much success. In 1917, he was made Honorary Curator of Ornithology of the Washington State Museum at the University of Washington, a position which he continued to fill until his death. Rathbun was elected an Associate of the A. O. U. in 1893 and a Member in 1902, and contributed occasionally to the pages of 'The Auk.' He organized the Caurinus Club which later became the Pacific Northwest Bird and Mammal Society, of which he was made an Honorary Life Member in 1944.

His collection of birds has been given to the Washington State Museum, and his notebooks and journals have been deposited in the Northwest Collection of the University of Washington Library. Rathbun was not a voluminous writer. His bibliography of 22 titles comprises chiefly contributions to 'The Auk' and 'The Murrelet.' A more complete biographical sketch by Martha Reekie Flahaut, on which this notice is chiefly based, accompanied by a bibliography and portrait, was published in 'The Murrelet,' vol. 27, no. 3, pp. 41–46, December 27, 1946.—T. S. Palmer.

Ernest Evan Thompson Seton, a Member of the American Ornithologists' Union, died at Santa Fe, New Mexico, October 23, 1946, at the age of 86. He was the son of Joseph L. and Alice (Snowden) Thompson and was born at South Shields, England, August 14, 1860. Much of his early life was spent in the backwoods of Canada or on the western plains. His education was received at the Toronto Collegiate Institute, the Royal Academy in London, and Julian's Academy in Paris.

Seton was devoted to the wilds of Canada. He spent the years from 1866 to 1870 in the backwoods of eastern Canada, the period from 1882 to 1887 on the plains of Manitoba, and in later years made an extended trip to the barren grounds of northern Canada. While in Manitoba he served as Provincial Naturalist and published his 'Birds of Manitoba' in 1891 under the authorship of E. E. Thompson. Later he adopted the surname Seton and became generally known as Ernest Thompson Seton. He was elected an Associate of the Union at the first meeting in 1883 and a Member in 1901, thus maintaining a continuous membership extending over 63 years.

As an ornithologist, Seton was best known by his 'Birds of Manitoba,' 1891, and his illustrations in the 'Century Dictionary' and in Chapman's 'Bird Life,' 1897; as a mammalogist by 'Wild Animals I have known,' 1898, 'Trail of the Sandhill Stag,' 1899, 'Life-histories of Northern Animals,' (2 vols.) 1909, 'Wild Animals at Home,' 1913, and 'Lives of Game Animals,' (4 vols.) 1925–1928; and as a lecturer by his ability to attract and hold the attention of an audience under any conditions. He was deeply interested in the Boy Scout movement and served as Chief Scout from 1910 to 1915, organized the Woodcraft Indians, and was an authority on Indian customs and Indian lore. He was an enthusiastic and effective conservationist, and through his books and magazine articles was able to reach an unusually large audience. He married twice, Grace Gallatin in 1896, from whom he was divorced, and Julia M. Battree Moss in 1935.—T. S. Palmer.

Althea Rosina Sherman, a Life Member of the American Ornithologists' Union, died in her ninetieth year at her home in National, near McGregor, Iowa, April 16, 1943, a week after she had suffered a stroke. She was born in Farmersburg Township, Clayton County, Iowa, October 10, 1853, and was the last member of the pioneer family of Mark Bachelor and Sibyl Melissa Clark Sherman; her sister, Dr. Amelia Sherman, died in 1940. She graduated from Fayette Seminary and then attended Oberlin College, Oberlin, Ohio, where she received the degrees of A.B. in 1875 and A.M. in 1882. After graduation, she studied art in Chicago and New York, and

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served as instructor in drawing and painting at Carleton College, Northfield, Minnesota, from 1882 to 1887, and as supervoisr in drawing in the public schools of Tacoma, Washington, from 1892 to 1895.

Miss Sherman was elected an Associate of the A. O. U. in 1907, a Life Associate in 1909, and a Life Member in 1912. She attended the annual meetings whenever possible and frequently contributed to the programs. She was particularly interested in life histories and territorialism, and in 1910 published in the 'Wilson Bulletin' an important contribution to the latter subject under the title 'At the Sign of the Northern Flicker.' Her papers were based on the most painstaking observations and were models in clear and accurate statement. In addition to her membership in the Union, she was elected an Honorary Member of the Wilson Ornithological Club in 1902, a Member of the Cooper Ornithological Club in 1911 and a Life Member of the latter club in 1916.

Just before World War I, Miss Sherman made an extended trip to Europe, northern Africa and parts of southern Asia, an account of which she published in a series of four articles in the 'Wilson Bulletin' in 1915 and 1916. Sailing from New York, November 7, 1913, she went through the Mediterranean and Red Seas to Bombay, India, stopping en route at Madeira, Gibraltar, Morocco, Algiers, Naples, and Cairo, crossed India to Calcutta, and returned by a different route. While in Egypt, she went up the Nile to southern Egypt, then returning, went north through Palestine to Turkey, Greece, and as far north as Sweden. She returned through western Europe to New York in August, 1914, after an absence of 10 months during which she had visited about 20 countries. Her observations on birds as well as foreign lands were published under the title 'Birds by the Wayside' in a series of four articles in the 'Wilson Bulletin' on India, Egypt, Palestine, and Greece. Much of the trip was made in winter, and the journey from Cairo to Athens was made just before the spring migration so that birds were much fewer than they would have been a little later.—T. S. Palmer.

Charles Haskins Townsend, elected an Associate of the American Ornithologists' Union in 1883 and a Member in 1901, died at Coral Gables, near Miami, Florida, January 28, 1944, at the age of 84. He was the son of Reverend D. W. and Elizabeth (Kier) Townsend, and was born at Parnassus, Pennsylvania, September 29, 1859. His parents had intended to prepare him for the ministry, but at an early age he became interested in natural history. He was educated in the public schools and in 1909 received the honorary degree of Sc.D. from Washington and Jefferson College. In his autobiographical sketch in The Condor for 1927 (pp. 224–232), he mentions the fact that his first zoological books were J. G. Wood's 'Bible Animals,' an Agricultural Report for 1856 containing Ezekiel Holmes's 'Birds Injurious to Agriculture' and Robert Kennicott's 'Quadrupeds of Illinois.' He also had access later on to the 'American Encyclopaedia.'

At the age of twenty, he joined Ward's Natural History Establishment in Rochester New York, where he met W. T. Hornaday, F. A. Lucas, W. B. Barrows, H. E. Crampton, and W. M. Wheeler. Three years later he spent some time at the Academy of Natural Sciences in Philadelphia, where among others he met Edwin Sheppard, the wood engraver, and Titian R. Peale, the explorer. He recalled that "Mr. Peale kindly allowed me the use of his 'Audubon.' a volume at a time, my first acquaintance with this work." At the Academy he also met W. L. Baily, W. E. Saunders, and Spencer Trotter.

In 1883, he first met Professor S. F. Baird who offered him a position in the U. S. Fish Commission, and within a month shipped him off to the salmon hatchery on the

McCloud River, in northern California, where he began his career in fishery work which was destined to occupy his attention for the remaining sixty years of his life. In 1885, he was detailed to the Revenue Cutter 'Corwin' on a voyage to Kotzebue Sound, Alaska, and accompanied Lieutenant John Cassin Cantwell, a nephew of John Cassin, the ornithologist, to the headwaters of the Kowak River. The following year he made a cruise on the 'Albatross' to the Bahamas. In 1887, he collected on the Segovia River in Honduras, and in the autumn of that year accompanied the Fish Commission Steamer 'Albatross' through the Straits of Magellan to the Pacific and stopped 11 days at the Galapagos Islands. During the decade from 1886 to 1896, while he was serving as Naturalist on the 'Albatross,' most of the time was spent in the North Pacific, surveying the fishery grounds along the northwest coast and in the Bering Sea and mapping the fur-seal rookeries on the Pribilof Islands. He also took part in the Bering Sea patrol, charted part of the Aleutian region, and sounded the route for the Hawaiian cable. He was a member of the Fur Seal Commission in 1896–1897 and, after serving five years as Chief of the Division of Fisheries of the Fish Commission, in 1902 was detailed as Fishery Expert to the Russo-American Arbitration Commission at The Hague.

From 1902 to 1937, he was Director of the New York Aquarium where he maintained the exhibits in a high degree of efficiency. During this period, he served as Acting Director of Investigations of the 'Albatross' in the Gulf of California in 1911. At the close of the Semicentennial Meeting of the Union in 1933, he entertained the members at an evening reception at the Aquarium an occasion long remembered by those who were fortunate enough to be present.

Townsend's publications, about 100 titles in all, were mainly devoted to fisheries, fur seals, whaling and oceanography, but he also published several papers on birds. Chief among these were his contribution to the Proceedings of the U. S. National Museum for 1887 entitled 'Field Notes on the Mammals, Birds and Reptiles of Northern California,' and his descriptions of several new species of birds from the California coast and islands in the 'Proceedings' for 1880.—T. S. Palmer.

Walter Cleaveland Henderson, an Associate of the American Ornithologists' Union since 1917, died suddenly at the age of 70 at his home in Saint Petersburg, Florida, January 1, 1947. He was born in Chelsea, Massachusetts, July 6, 1876. His education was received in the public schools of Chelsea and Somerville, Massachusetts, and in 1903 he graduated from the Boston University Law School. In 1926 he received the degree of A.B. from George Washington University, Washington, D.C.

In 1897 he entered the Customs Service in Boston and ten years later was transferred to the Forest Service in the U. S. Department of Agriculture. When Dr. E. W. Nelson became Chief of the Biological Survey in 1916, he invited Henderson to become Associate Chief, in which capacity he took an active part in the administrative and legal work and represented the Survey at many conferences and meetings in various parts of the country. In 1940, with the consolidation of the Biological Survey and the Bureau of Fisheries as the Fish and Wildlife Service in the Department of the Interior, Henderson became Assistant Director of the Service under Dr. I. N. Gabrielson, a position which he retained until his retirement in 1942 on account of ill health. In addition to his membership in the A. O. U., he was a member of the American Society of Mammalogists, the Baird Ornithological Club, the Biological Society of Washington, and the National Geographic Society. He is survived by his wife, Mrs. Margaret Henderson, and a son, Fletcher Henderson.—T. S. Palmer.

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Owing to recent gratifying increase in the membership of the American Ornithologists' Union, the January issue of The Auk is virtually exhausted as the April number goes to press. In order that any further demands for the January issue may be met, it is urgently requested that those members of the Society who do not keep a permanent file of the journal, return their copies of the January number to the Business Manager when they have finished reading them.

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